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BIBLIOGRAPHY OF Technical Reports

August 7, 1953 Vol. 20, No. 2

CHEMICALS AND ALLIED PRODUCTS

Dyes

Testing of dyestuffs, textile finishes and other chemicals for toxicological effects by I. G. Farben A.G., by Miles A. Dahlen and Raymond A. Pingree. U. S. Army. European Theater of Operations. Office of the Quartermaster. Technical Intelligence Branch. Procurement Division. Sep 1945. 7f Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Enlargement Print $2.50. PB 109210

1. Textile aids - Tests - Germany 2. Textiles - Chemicals - Toxicology - Tests - Germany 3. Textiles - Tests - Germany 4. Textiles - Dyes and dyeing - Toxicology - Tests - Germany 5. BIOS M4.

Plastics and Plasticizers

Dielectric breakdown of plastics at radio frequencies, by J. J. Chapman, J. W. Dzimianski, C. F. Miller. Johns Hopkins University, Baltimore, Md. Jul 1949. 59p photos, drawings, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 109419

A study is made of the dielectric breakdown of the plastics at radio frequencies. Ceramics as well as rigid thermoplastic, molded thermosetting and laminated thermosetting materials were examined. Data is submitted that is useful for design and development of radio frequency devices. A number of graphs were plotted and analyzed. The equipment used is described in detail.

Test on insulating material Mouldarta 192-A submitted by Westinghouse Electric and Manufacturing Company, prepared by Roy L. McFolin. U. S. Naval Research Laboratory. Aug 1943. 14p graph, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. Limited supply available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $.50. PB 109318

1. Mouldarta 192-A (Trade name) 2. Insulating materials - Tests 3. NRL R-2132. 4. NAVSHIPS Prob M1-24.

Test on Thermacote protective coating submitted by Thermacote Company, Los Angeles, Calif., by F.M. Holcomb, Jr. U. S. Naval Research Laboratory. Sep 1943. 11p photos, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 109323

1. Thermacote (Trade name) 2. Coatings, Protective - Tests 3. Thermacote Co., Los Angeles, Calif. 4. NRL B-2151.

Paints, Varnishes and Lacquers

Optics of paints. Second report: Spectral reflectivity of commercial infra-red reflecting deck paints to 2.5 microns, by J. A. Sanderson and W. R. Holm. U. S. Naval Research Laboratory. Jan 1943. 30p drawing, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 109509

First report is NRL letter S19-422 of 26 Nov 1942. 1. Paints, Infrared - Reflectivity 2. NRL H-1989.

Anti-fouling paint studies. Part II: An investigation of the inherent errors in leaching rate measurements, by J. B. Ballentine, W. H. Stewart, Marvin O. Yeiter, and A. L. Alexander. U. S. Naval Research Laboratory. Jan 1946. 43p photos, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 109506

This report describes an investigation of the extent of error as encountered in normal studies. The mean error introduced in the leaching rate technique is determined along with the over-all error resulting from the preparation of the paint batches and their application to panels with a result that the error of the leaching rate determination is somewhat smaller than that attributed to the preparation of duplicate batches of paint. The effect of grinding time on surface area and leaching rate is discussed. Although surface area is increased with longer grinding periods a corresponding increase in leaching rate is noticeably lacking. It appears, therefore, that brief grinding periods are equivalent to long ones as it affects leaching rate values. For Part 1 see PB 109314. NRL P-2744.

Flexible anti-fouling paint adaptable to immersed rubber components, by Allen L. Alexander. U. S. Naval Research Laboratory. Dec 1944. 26p photos Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. Limited supply available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $.75. PB 109527

This report describes some elementary experiments in the development of a highly elastic anti-fouling paint adaptable to rubber surfaces used in the construction of underwater sound components. The formulations described are based on the results of early experiments with anti-fouling paints for flying boat hulls and elastic paints designed for the camouflage of rubber parts of airplanes such as de-icer boots. A formulation is described which, based on panel experiments, shows considerable promise in retarding the accumulation of marine organisms on rubber components of underwater sound gear. NRL P-2413.

Ship bottom paint systems. Part I: The role of fatty acids and soaps in the adhesion of underwater primer, by Fred Arndt, S. B. Crecelius and J. E. Huskey. U. S. Naval Research Laboratory. Feb 1946. 47p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 109487

Recent experience with systems for the protection of underwater surfaces of ships has indicated poor performance due to loss of adhesion. This report describes an investigation of the primers designed for direct application to steel over which anti-fouling paints are applied. A number of primers were prepared in which the pigment-volume ratio was varied as well as the type of pigment. The composition of the primer matrix was varied between wide limits. Exposures were made of each system for periods up to seven months. The data indicate the preference for zinc oxide over zinc chromate as an underwater primer pigment for steel. NRL P-2763.

Inorganic Chemicals

Calculation of the electrostatic energy of a crystal lattice, with application to boron nitride, an A.E.R.E. report, by K. W. Morton. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Feb 1953. 21p diagrs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.90. PB 109389

S. O. code no. 70-674-1-30.
1. Crystals - Lattices - Electrostatic energy - Gt. Brit. 2. Boron nitride - Crystals - Lattices - Electrostatic energy - Gt. Brit. 3. Atomic power - Research - Gt. Brit. 4. AERE T/R 1110.

General survey of the use of methyl bromide as a fire extinguishing agent, by Richard L. Tuve. U.S. Naval Research Laboratory. Feb 1943. 91p photos, drawings, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.25, Photostat $12.50. PB 109218

The dominating characteristics of extinguishers utilizing methyl bromide, carbon tetrachloride and carbon dioxide, are compared and discussed with only general reference to their conditions of application. Results of qualitative comparative tests on oil fires at the Laboratory using the above materials are given. NRL P-1998.

Hydrides and borohydrides of light elements. Progress report no. XXVII, July 1-Sep 30, 1947, by H. I. Schlesinger and George W. Schaeffer. U. S. Naval Research Laboratory. Dec 1947. 21p drawings, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108776

This report covers the work on hydrides of boron in which there is reported results on sodium aluminum hydride preparation in tetrahydrofuran. A yield of 70% of sodium aluminum hydride of 92% purity was obtained. There is also reported the study on the preparation of borazole and some work on its stability and preliminary steps in the production of other boron-nitrogen-hydrogen compound. Contract no. N6ori-20. NRL C-3208.

Hydrides and borohydrides of light weight elements and related compounds. Chicago. University, Chicago, Ill. Final report for the period Aug 1, 1950-Jun 30, 1951 on Contract N6ori-20, T. O. X, by H. I. Schlesinger and Riley Schaeffer in collaboration with L. Hohnstedt, A. Leffler, M. Steindler and G. Urry. Jun 1951. 63p drawings, graph, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photostat $8.75. Limited supply available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $1.75. PB 109541

Includes Progress reports 39-42, Aug 1, 1950-Jun 30, 1951.
1. Borohydrides, Metallic 2. Borazole - Preparation 3. Lithium borohydrides - Chemical reactions 4. Hydrazine - Chemical reactions 5. Sodium aluminum hydride - Preparation.

Inhomogeneity of thallium halide mixed crystals and its elimination, by A. Smakula, J. Kalnajs and V. Sils. Massachusetts Institute of Technology. Laboratory for Insulation Research. Mar 1953. 21p drawings, diagr, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 109294

Prisms, cut from mixed crystals of thallium halides, as they are used at present for infrared spectroscopy, show optical inhomogeneity which causes an undesirable decrease of resolution. By chemical, X-ray diffraction, and thermal analysis it was possible to trace the cause of this defect to the use of incorrect data of the minimum melting points of the compositions from which the crystals were grown. The melting points of the thallium halides and of their binary systems have been redetermined, and crystals grown from compositions corresponding to the accurate minimum melting points have been found to be entirely homogeneous. The lattice constants and thermal expansion coefficients of the new mixed crystals have been measured. O.N.R. Contracts N5 ori-07801, N5ori-07858. MIT LIR TR 67.

Ordnance Chemicals

N.P.F. analysis. Progress report covering the period Mar 1, 1953-Jun 1, 1953 under Contract no. N174s-9852 to U. S. Naval Powder Factory, Indian Head, Md., by James H. McNeal. Delaware. University. Dept. of Chemistry. Jun 1953. 12p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 109740

NPF P-2. For previous report see PB 108801.
1. Triacetine - Determination 2. Powders, Smokeless - Analysis.

Analytical Chemistry

X-ray diffraction study of barium titanate, by H. T. Evans, Jr. Massachusetts Institute of Technology. Laboratory for Insulation Research. Jan 1953. 36p photos, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108878

Contracts N5ori-07801, N5ori-07858. A considerable portion of the work described here has been reported in Technical reports nos. 39 and 54, Philips Laboratories, Inc.
1. Barium titanate - Crystal structure 2. Barium titanate - Spectrographic analysis 3. Barium titanate - X-ray inspection 4. Philips Laboratories, Inc., Irvington-on-Hudson, New York 5. MIT LIR TR58.

Chemical Engineering and Equipment

Apparatus for the controlled dispersion of vapors from red fuming nitric acid, by Stanley B. Goldberg. U. S. Chemical Corps. Medical Laboratories, Army Chemical Center, Md. Oct 1952. 18p photos, drawings, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108445

Project no.: 4-61-14-002. Test Program no.: T9 CMLRE-ML-52.
1. Nitric acid, Red fuming - Physiological effects 2. Nitric acid, Red fuming - Diffusion 3. Nitrogen oxides - Physiological effects 4. Nitrogen oxides - Diffusion 5. Dispersers, Insecticide - Design 6. Dispersing agent 7. Apparatus, Dispersing 8. Animals - Effect of nitrogen oxides 9. CC MD RR 140.

Use of the humidity cabinet in the acceptance testing of corrosion preventive compounds, by William C. Sierichs and Thomas P. May. U. S. Naval Research Laboratory. Apr 1945. 38p photos, drawings, diagr, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 109539

A radically new method, which closely simulates actual dew formation, is described along with some typical experimental results obtained by this new method. NRL P-2514.

Miscellaneous Chemicals

Effect of unsaturated hydrocarbons on the thermal decompositions of tetrahydrofuran and cyclopentane, by Nancy M. Lodge. 1949. 96p diagr, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.25, Photostat $12.50. PB 109590

The static system vapor-phase thermal decompositions of tetrahydrofuran and cyclopentane in the presence of added unsaturated hydrocarbons have been studied at 530° and 546°C for tetrahydrofuran and 546° and 555°C for cyclopentane. Experimental methods were described in respect to preparation and purification of materials, apparatus, operation of the system, and analytical procedures. Among the effects considered were time effects in the propylene and ethylene accelerated decompositions, effect of increased surface on these decompositions, and effect of nitric oxide on propylene accelerated reactions. Effects of added substances other than ethylene and propylene, were also considered. Contract N6 onr-241, Task I, Project NR056-051.

Lifetime of fluorescence of simple ketones, by Walter E. Kaskan. Rochester. University. Dept. of Chemistry, Rochester, N. Y. 1949. 114p diagr, graphs, tables Available from Library of Congress, Publication Board Project, Washington

25, D. C. Microfilm $4.75, Photostat $15.00. PB 109591

The effects of pressure, temperature, and exciting intensity on the lifetime of fluorescence of gaseous acetone have been investigated. Lifetime has been found to decrease with increasing pressure, temperature and exciting intensity. The effect of pressure has been ascribed to the formation of double molecules from one molecule in the fluorescing state and one in the ground state. The effect of temperature has been ascribed to the change in population of vibration-rotation levels in the upper state with change in temperature. An attempt was made to explain the effect of intensity. The effects of pressure, temperature, exciting intensity, and pressure of oxygen on the lifetime of fluorescence of biacetyl were also investigated. Contract N6onr-241, Task order I.

Melting transition of polymethylene, by L. Mandelkern, M. Hellmann, D. W. Brown, D. E. Roberts, and F. A. Quinn, Jr. U. S. National Bureau of Standards. Jun 1953. 12p graph Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 109733

Technical report no. 11 on project ONR (QMC) NR-330-013. Government order NA-onr-79-49.
1. Polymethylene - Thermal properties 2. NBS 2538.

Nature and chemical stability of Halowax compounds, by John K. Wolfe. U. S. Naval Research Laboratory. Sep 1943. 22p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. Limited supply available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $.75. PB 109319

1. Halowax (Trade name) 2. Impregnants - Stability tests 3. NRL P-2155.

Photocurrent, space-charge build-up and field emission in alkali halide crystals, by A. von Hippel, E.P. Gross, J. G. Jelatis and M. Geller. Massachusetts Institute of Technology. Laboratory for Insulation Research. Feb 1953. 39p drawing, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108953

Additively colored alkali-halide crystals represent, in a first approximation, a transparent solid with frozen-in electrons which can be mobilized by light absorption. When moving towards the anode, these electrons leave a positive space charge behind, and an adjustable cathode fall results which can be steepened until electrons are released by field emission. The steady state and transient solutions for the charging and discharging cycle are calculated, the effects of light intensity, wavelength and field emission discussed, and KBr crystals investigated experimentally as function of time, voltage, light intensity and color-center density. O.N.R. Contracts N5ori-07801, N5ori-07858. MIT LIR TR 59.

Quenching action of plutonium and iron on the fluorescence of uranium in sodium fluoride phosphors, an A.E.R.E. report, by G. N. Walton, G. Hutton, J.A.W. Dalziel. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Jul 1952. 41p photos, diagrs, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.50. PB 108722

HD. 732. S. O. code no. 70-674-0-91.
1. Uranium - Fluorometric determination - Gt. Brit. 2. Phosphors, Sodium fluoride - Transmission - Gt. Brit. 3. Sodium fluoride - Properties - Gt. Brit. 4. Plutonium - Radiometric determination - Gt. Brit. 5. Iron - Radiometric determination - Gt. Brit. 6. Atomic power - Research - Gt. Brit. 7. Ultraviolet radiation - Transmission - Gt. Brit. 8. AERE C/R 966.

Silicone-diester mixtures and greases prepared from them, by R. L. Merker. U. S. Naval Research Laboratory. Apr 1946. 16p graphs (1 fold), tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 109486

It has been found that the diesters of dicarboxylic acids are mutually miscible with certain silicone fluids. This has made possible the addition of many new additives to these silicone fluids because of their increased solubilizing effect when diluted by small amounts of diester. Several of these fluid mixtures have been prepared and their characteristics have been evaluated. In addition to this, numerous greases have been prepared in the conventional manner by thickening these fluid mixtures with lithium stearate. These new greases were extremely heat and oxidation stable. NRL P-2802.

Solubility of gases in liquids used in aircraft. Part II: Solubility of atmospheric gases, hydrogen and carbon monoxide, by W. G. Glendinning and M. E. Bedwell. Part III: Heats and entropies of solution derived from the gas solubility results, by T. P. Hughes. Gt. Brit. Royal Aircraft Establishment, Farnborough, England. Feb 1951. 45p drawing, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 108865

1. Gases - Solubility - Gt. Brit. 2. Carbon dioxide - Solubility - Gt. Brit. 3. Carbon monoxide - Solubility - Gt. Brit. 4. Argon - Solubility - Gt. Brit. 5. Hydrogen - Solubility - Gt. Brit. 6. Nitrogen - Solubility - Gt. Brit. 7. Oxygen - Solubility - Gt. Brit. 8. Solvents - Physical properties - Gt. Brit. 9. RAE TN Chem 477.

Some aldehydeamine accelerators, by Juan C. Montermoso. U. S. Naval Research Laboratory. Mar 1949. 22p graphs, tables (2 fold) Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $.75. PB 111156

As part of the search for better accelerators for

rubber vulcanization, a study was undertaken of some aldehydeamines with the purpose of correlating molecular structure with the physical properties imparted to the product. Six compounds synthesized for the study were evaluated in comparison with mercaptobenzothiazole (Captax) and the heptaldehydeaniline condensation product (Hepteen Base) with regard to tensile strength, tensile stress at 500% elongation, ultimate elongation, oven aging, oxygen-bomb aging, compression set, free sulfur, and hardness. NRL C-3300.

Sulphite complexes of palladium and their reactivity with carbon monoxide, by G. A. Earwicker. Gt. Brit. Royal Aircraft Establishment, Farnborough, England. Jul 1949. 60p photo, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 108860

Sulphite complexes of palladium were investigated as possible reagents for detecting carbon monoxide because of the natural aptitude of palladous compounds for this purpose and the susceptibility, in general, of compounds containing sulphur-to-metal bonds to reaction with carbon monoxide. A study of the sulphite chemistry of palladium confirmed this latter fact and has provided information on the mechanism of the reaction. A number of new complexes of palladium were prepared and their constitution examined. RAE TN Chem 458.

Use of chemical materials as shark repellents. U. S. Naval Research Laboratory. Final report, prepared by J. M. Fogelberg. Sep 1944. 27p photos, drawings, graphs (1 fold) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 109473

This is a final report on the development and testing of a material designed for the protection of personnel from attack by sharks. Earlier laboratory development is summarized and the results of the field testing are presented in their entirety. NRL P-2373.

Vapor-liquid equilibria for mixtures of alkali metals (sodium-potassium), by G. B. Kistiakowsky. U. S. Naval Research Laboratory. Apr 1941. 13p drawing, graph, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 109441

Vapor-liquid equilibrium data for the system sodium-potassium at one atmosphere have been determined experimentally, and the results are tabulated. NRL P-2958. NDRC B-22.

DETERIORATION STUDIES

Failure of electronic equipment under tropical service conditions, by J. M. Leonard. U. S. Naval Research Laboratory. Feb 1945. 10p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. Limited supply available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $.25. PB 109521

The environmental factors which are largely responsible for the failure of electronic equipment in the tropics are discussed. These factors are moisture and fungus, and of the two, the former is by far the more deleterious. Corrective measures, based upon exclusion of moisture, are described. NRL P-2475.

Humidity vessel for the laboratory evaluation of electrical components, by Wilson M. Whaley and John M. Leonard. U. S. Naval Research Laboratory. May 1945. 9p photos, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 109337

A vessel in which small electrical components can be maintained at any desired humidity is described. The arrangement permits electrical measurements without disturbance of the components or the humid atmosphere. Reasonably precise measurements on large numbers of items may be made with a minimum expenditure of time and effort. The device is simple and inexpensive to build. NRL P-2523.

Taxonomic study of fungi associated with the deterioration of military equipment, by D. D. Ritchie. U. S. Naval Research Laboratory. Apr 1946. 21p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. Limited supply available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $.75. PB 109462

1. Fungi, Tropical 2. Equipment, Army - Tropical deterioration 3. NRL P-2824.

ELECTRICAL MACHINERY

Communication Equipment

Design notes on distributed amplifiers, by Harry Spett. U. S. Signal Corps Engineering Laboratories, Fort Monmouth, N. J. Mar 1953. 23p diagrs, graphs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 109633

This report presents the analysis of the coupling network for distributed amplifiers most suitable for moderate cut-off frequencies, and to derive the necessary design parameters yielding a simple and explicit solution. Dept. of the Army project no. 3-27-01-172. Signal Corps project no. 2055J. SCEL TM M-1490.

Electric pencil: Performance over radio circuits, by G. W. Barnes. Gt. Brit. Royal Aircraft Establishment, Farnborough, England. Jan 1949. 10p photos, diagr, graph Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 108811

Handwritten messages or sketches may be presented remotely by continuously transmitting the two coordinates of a pencil point over a radio or wire circuit. Such a system does not require any special operating skill and has been considered as an alternative to more usual communication methods such as Morse and printing telegraph systems. The work described was undertaken to determine the bandwidth required and the signal to noise ratio acceptable at the receiver to ensure intelligible interpretation. RAE TN Rad 443.

Evaluation of CEE (German) obtained by Naval Technical Mission to Europe, by M. Trbovich. U. S. Naval Research Laboratory. Dec 1946. 72p photos, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.50, Photostat $10.00. PB 109272

A quantity of diversified German aircraft electrical control equipment was obtained by the Naval Technical Mission to Europe. This equipment includes one or more of each of the following: voltage regulators, relays, circuit breakers, switches, rheostats, and an electric windshield defroster control unit. An analysis of this captured enemy equipment was made to determine details which might be of value in the development of electrical equipment for Naval aircraft. NRL E-3034.

Evaluation of model X-DBH radio direction finder, by John J. Conlon. U. S. Naval Research Laboratory. Mar 1948. 33p photos, diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. Limited supply available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $1.00. PB 109573

Laboratory and field tests indicate that the X-DBH MF/HF direction finder which covers the range of 0.25 to 30 Mc, is satisfactory. In the event full scale production is contemplated, certain minor improvements in electrical and mechanical characteristics, as noted, are desirable. NRL R-3259.

Field comparison of modulation methods for facsimile communication over ionospheric radio circuits, by Morris Acker and Bernard Goldberg. U. S. Camp Coles Signal Laboratory, Fort Monmouth, N. J. Dec 1952. 102p photos, diagrs (part fold) graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.50, Photostat $13 75. PB 109470

Signal Corps project no. 132A.
1. Radio transmission, Multichannel 2. Radio waves - Transmission 3. Radio waves - Propagation - Ionospheric 4. Radio waves - Modulation 5. SCEL TM 1481.

Frequency spectra and band widths of amplitude-modulated radio telegraph transmissions, by B. Salzberg. U. S. Naval Research Laboratory. Dec 1944. 30p graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. Limited supply available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $.75. PB 109537

1. Radio telegraph - Signals 2. Radio transmission - Modulation characteristics 3. Radio transmission - Mathematical analysis 4. NRL R-2426.

Optic-axes and critical coupling in the ionosphere, by Norman Davids. Pennsylvania State College, Ionosphere Research Laboratory, State College, Pa. Jan 1953. 22p graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 109627

Contract no. AF 19 (122)-44.
1. Ionosphere - Research 2. Radio waves - Propagation - Ionospheric 3. Atmospherics - Waves 4. PSC IRL SR 43.

Outline of a theory of semantic information, by Rudolf Carnap and Yehoshua Bar-Hillel. Massachusetts Institute of Technology. Research Laboratory of Electronics. Oct 1952. 51p diagrs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 109609

Contract no. DA36-039-sc-100. Dept. of the Army project no. 3-99-10-022. Signal Corps project no. 8-102 B-O.
1. Semantics 2. Communications - Theory 3. MIT RLE TR 247.

Over voltage output for communication equipment, by R. R. Zirn and J. M. Miles. U. S. Naval Research Laboratory. Apr 1946. 16p diagrs, graph Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. Limited supply available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $.50. PB 109493

1. Voltage controllers 2. Communications - Equipment - High frequency 3. NRL R-2783.

Performance of the British FH-3 and the International Telephone & Radio Laboratories crossed loop type high frequency direction finders (aboard USS Corry DD 463), by M. K. Goldstein. U. S. Naval Research Laboratory. Jun 1942. 62p photos, fold diagr, graphs (1 fold), tables Available from Library of Congress, Publication Board

Project, Washington 25, D. C. Microfilm $3.00, Photostat $8.75. PB 109515

1. FH-3 (Direction finder) 2. Radio direction finders (HF) 3. Radio direction finders - Loops 5. NRL R-1896.

Philco beacon marker receiver BC-357-C and Detrola beacon marker receiver EG-M, prepared by R. A. Gordon and S. Riccobono. U. S. Naval Research Laboratory. Jun 1942. 53p drawings, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 109499

1. Radio beacons - Receivers 2. BC-357-C (Receiver) 3. EG-M (Receiver) 4. NRL R-1894.

Poor reception of the transmissions from the Annapolis high power radio station in the vicinity of Newport, Rhode Island 12 Jun 1942 to 22 Jul 1942, by H. E. Dinger. U. S. Naval Research Laboratory. Aug 1942. 21p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 109513

1. Radio interference - Measurement 2. NAVSHIPS Prob W5-7 3. NRL R-1916.

Selected problems in the preparation, properties and application of materials for radio purposes. Gt. Brit. Dept. of Scientific and Industrial Research. Radio Research Board. Dec 1952. 29p Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.40. PB 109388

Noel Ashbridge, Chairman. S. O. code no. 47-29-25. 1. Radio - Materials - Gt. Brit. 2. Radio equipment - Materials - Gt. Brit. 3. Ceramics - Dielectric properties - Gt. Brit. 4. Ceramic materials - Properties - Gt. Brit. 5. Ceramic materials, Semiconducting - Gt. Brit. 6. Polymers - Dielectric properties - Gt. Brit. 7. Magnetic materials - Dielectric properties 8. DSIR Rad R SR 25.

Storage deterioration of model RCH receiver, by A. L. Hedrich. U. S. Naval Research Laboratory. Apr 1946. 18p graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 109479

The Model RCH Receiver is designed for use where it is important that receivers with very low radiation be employed. This equipment covers the frequency ranges of 80 to 560 kilocycles and 1.9 to 24 megacycles in five frequency bands. Tests were performed to determine the reasons for deterioration in performance after prolonged storage of these receivers in their original packing containers. NRL R-2803.

Theoretical and experimental study of the recombination coefficient in the lower ionosphere, by A. P. Mitra and R. E. Jones. Pennsylvania State College. Ionosphere Research Laboratory, State College, Pa. Mar 1953. 78p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.50, Photostat $10.00. PB 109628

Contract no. AF 19 (122)-44.
1. Ionosphere - Research 2. Electrons - Ionization - Theory 3. Electron theory 4. PSC IRL SR44.

X-band frequency measuring system, by I. K. Munson. U. S. Naval Research Laboratory. May 1948. 13p photos, diagrs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 109568

There has been a demand for a system for measuring frequencies in the X-Band with accuracy and convenience. Measurements made with the apparatus described in this report have an accuracy as high as 0.0005 percent under average conditions. The theory of operation is included as well as a description of the various system components. NRL R-3283.

Electronics

Acceptability tests of model F-26/UPR wave trap, by H. K. Weidemann. U. S. Naval Research Laboratory. Jun 1946. 28p photos, drawing, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 109440

This report describes the electrical and physical tests, which were applied to the F-26/UPR wave trap. The F-26/UPR wave trap was designed for use with either the AN/SPR-2 or the AN/APR-5AX receiver, for the primary purpose of determining the fundamental frequency of the received signal. The device may be used as a rejection filter to attenuate the signals of nearby radars and transmitters in the frequency range of 1000 to 6000 megacycles per second. A method for setting the initial calibration for the wave trap is described. The attenuation characteristics of the unit are presented with conclusions and recommendations concerning the use of this type of a device as a frequency measuring instrument. NRL R-2884.

Application of doubler mixer technique to electronic problems, by H. O. Lorenzen. U. S. Naval Research Laboratory. Apr 1946. 10p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. Limited supply available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $.25. PB 109492

This report presents a double mixer system which provides improved image rejection in high frequency receivers, amplification over a band width twice that of a given video system, and improved selectivity for high frequency harmonics. NRL R-2799.

Experiments with a light under water; optical signalling ranges and visibility in the sea, by E. O. Hulburt. U. S. Naval Research Laboratory. Feb 1944. 26p photos, drawing, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. Limited supply available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $.75. PB 109269

1. Visibility, Underwater 2. Signals, Light - Range 3. Signals, Underwater - Optical range 4. NRL H-2231.

Features of design, preparation and use of naval window, by T. D. Hanscome. U. S. Naval Research Laboratory. May 1944. 76p photos, drawings, (part fold), graphs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.50, Photostat $10.00. PB 109437

Appendix 1. Launching chutes for the TBF and SNB-1 aircraft. - Appx. 2. Plan drawing of NRL dispenser. - Appx. 3. Use of rockets. - Appx. 4. Specifications. - Appx. 5. References and bibliography. 1. Window (Anti-radar) 2. Window (Anti-radar) - Dispensers 3. NRL R2289.

Field method reduction of bandwidth of Loran receivers and the effect on operation, by J. W. Brogden and H. D. Cubbage. U. S. Naval Research Laboratory. Jun 1946. 37p photos, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 109430

A summary of the tests conducted on the modified receivers as well as the method of change is included in this report. The specific instructions for the field changes of each model are contained in the appendices. Appendices contain specific instructions for the field changes of each model. NRL R2889.

FM-AM multiplier of high accuracy and wide range, by Robert Price. Massachusetts Institute of Technology. Research Laboratory of Electronics. Oct 1951. 16p drawings, diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 109471

An instrument is described which employs combined frequency and amplitude modulation to obtain nearly faithful multiplication with minimum space requirements. The multiplier operates over the major portion of the audio frequency range, including direct current, and over a dynamic range of 2500:1 in output product. Contract no. DA36-039-sc-100. Dept. of the Army project no. 3-99-10-022. Signal Corps project no. 8-102 B-O. MIT RLE TR 213.

Interim report of test of model CXGJ-4 (DBT), shipborne VHF direction finder, by R. L. Libby and S. R. Thrift. U. S. Naval Research Laboratory. Apr 1946. 71p photos, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.50, Photostat $10.00. PB 109483

1. CXGJ-4 (DBT) (Direction finder) 2. Radio direction finders (VHF) - Tests 3. NRL R-2801.

Notes on altitude delay settings, by John R. Williams and George A. Reams. Ohio State University Research Foundation. Mapping, Charting and Reconnaisance Research Laboratory. Feb 1952. 18p graphs (1 fold) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108624

Contract no. AF 18(600)-90. Technical paper 157. Project 485.
1. Radar - Rangefinding 2. Range finding - Altitude delay 3. OSURF TP 157 4. AAF WADC TR 52-96.

Propagation of electromagnetic waves in an inhomogeneous, isotropic medium above a plane boundary, by Leslie G. McCracken, Jr. U. S. Naval Research Laboratory. Feb 1953. 30p diagrs Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $.75. PB 111169

The problem of wave-propagation from a horizontal electric dipole in an inhomogeneous, isotropic medium above a plane boundary is examined. The asymptotic expansion for the horizontal component of the Hertz vector is developed, and an approximate expression, valid in the diffraction and interference regions, is developed for the electric field intensity. The work is illustrated by three examples (1) homogeneous atmosphere, (2) linear atmosphere, and (3) exponential atmosphere. For a physical atmosphere, a method of solution based on the theory of continued fractions is sketched. NRL R4117.

Services, facilities, and materials for research and investigation of crystal filters. Fourth quarterly technical report (final) on Contract no. W-36-039-sc-33632, by W. Wylde and S. A. Bokovoy. Miller, August $., North Bergen, N. J. 1948. 62p photos, drawing, diagrs (2 fold), graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photostat $8.75. PB 108819

1. Filters, Crystal 2. SIG Contract W36-039-sc-33632, Final report.

Spinning aerial for O.R.B., by A. N. Beresford. Gt. Brit. Royal Aircraft Establishment, Farnborough, England. Oct 1949. 20p photos, diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108812

1. Antennas, Omnidirectional - Gt. Brit. 2. Antennas, Omnidirectional - Mathematical analysis - Gt. Brit. 3. RAE TN Rad 462.

Study of atmospheric composition by airborne infrared gas analyzers, by Dudley Williams. Ohio State University Research Foundation, Columbus, Ohio. Feb 1952. 54p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 109404

This report gives an account of work done in this laboratory on the development of light-weight infrared gas analyzers for use in determination of atmospheric composition by balloon and rocket probing techniques. In addition to a discussion of instrumental problems in the design and use of air-borne gas analyzers, the report includes a discussion of results obtained in balloon flights at Holloman Air Force Base during the summers of 1951 and 1952. These flights were concerned with a determination of the vertical distribution of carbon dioxide and were largely exploratory; the results obtained thus far must be regarded as tentative. Scientific report no. 1 on Contract no. AF 19 (122)-13.

Study of atmospheric direction finding and ranging. Florida. Engineering and Industrial Experiment Station, Gainesville, Fla. Under Contract no. W28-003-sc-1306, by William J. Kessler.

Quarterly progress report no. 1, Feb 2, 1947 to Apr 17, 1947. Apr 1947. 51p photos, diagrs (part fold) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 108815

This report reviews the long range objectives and summarizes the progress achieved to date in connection with the Sferics research program.

Quarterly progress report no. 2, Apr 17, 1947 to Jul 17, 1947. Jul 1947. 27p photos (part fold), diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108816

Reproductions of photographic records are included to disclose the quality of calibration of the Adcock structure. Additional photographs are included to demonstrate the stability of the indicated bearings during diurnal periods and the large variations occuring during nocturnal periods. The improvements and measurements made on the wide-band wave-shape amplifier are reported. Curves and photographs are included to illustrate the characteristics of this amplifier. A brief discussion on the possible necessity for similar transient response of the amplifiers employed at each wave-shape station is included.

Quarterly progress report no. 3, Jul 17, 1947 to Oct 17, 1947. Oct 1947. 31p photos, diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108817

The reinstallation of the Adcock-loop comparator system is discussed and the modifications and improvements incorporated in the new installation are described. A description of the method of transcribing the data from the film records is given and curves showing the relationship between the indications of the Adcock and loop direction finders are included. A means for collecting information on the "standard wave error" of the Adcock antenna through the use of mutually perpendicular horizontal antennas is discussed. The improvements in the lumped-constant delay line to be used with the wave-shape units are mentioned and design information is presented so that the characteristics of the delay networks employed by each observing station may be made more nearly identical. The present status of the Dotlock control circuit and the final report on the low-frequency ionosphere measurements are also discussed.

Quarterly progress report no. 4, Oct 17, 1947 to Jan 17, 1948. Jan 1948. 34p photos, graphs (2 fold), tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108818

The modifications to the Adcock-loop comparator antennas in an attempt to reduce the angular variations observed with the Adcock direction finder are discussed. The experimental results of extending the horizontal transmission lines of the Adcock antenna to remove the impedance discontinuities or "end effects" from the immediate neighborhood of the vertical antenna elements are presented. A development of the analytic procedure for the determination of distance and ionosphere height from the data contained in atmospheric wave shapes is included and curves are presented to allow rapid processing of the observable data.

Test of acceptability of pre-production Navy model RXA antenna multicoupler, by J. A. Kirk. U. S. Naval Research Laboratory. May 1946. 26p photos, diagr, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 109467

1. RXA (Multicoupler) 2. Couplers, Radar - Tests 3. NRL R-2840.

Tests of model FRA frequency shift receiver converter equipment, by C. R. Neth. U. S. Naval Research Laboratory. May 1946. 34p photos, fold diagr, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 109466

1. Frequency changers - Tests 2. FRA (Frequency changer) 3. NRL R-2833.

Two-dimensional microwave Luneberg lens, by G.D.M. Peller and D. H. Archer. U. S. Naval Research Laboratory. Mar 1953. 27p photos, diagrs, graphs, tables Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $.75. PB 111153

A two-dimensional microwave model of the Luneberg lens has been designed employing the TE_{10} mode. It consists of two 36-inch diameter, almost-parallel, conducting plates with the space between plates filled with polystyrene. NRL R4115.

Continuously variable, single crystal, decade frequency generator, frequency range: 10 to 300 Mc/s, by R. S. Badessa and W. E. McDowell. U. S. Naval Research Laboratory. Jan 1945. 27p photos, diagrs (1 fold) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 109505

1. Generators, Decade frequency - Design 2. NRL R-2445.

Coupling between waveguides and cavity resonators for large power output, by Frederick B. Wood. California. University. Div. of Electrical Engineering. Electronics Research Laboratory. Microwave Tube Group, Berkeley, Calif. May 1953. 107p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.50, Photostat $13.75. PB 109671

Contracts W19(122)ac-38 and W33(038)ac-16649.
1. Green's functions 2. Coupling systems 3. Resonators, Cavity - Coupling 4. Waveguides - Coupling 5. Waveguides - Irises 6. UC IER ML TR 65.

Development of subminiature high-temperature capacitors. Annual summary engineering report no. 2, Jan 1952 to Jan 1953, on Contract no. AF33 (038)-17190, supplementary agreement no. 1, by H. Mack Thaxton. Balco Research Laboratories, Newark, N. J. Jan 1953. 52p drawing, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 109586

For other reports on this contract see PB 107639, PB 107358, PB 108223.
1. Capacitors, High temperature - Subminiature 2. Capacitors, Plastic dielectric 3. Dielectrics - Tests 4. Electronic equipment - Materials.

Engineering services in connection with the development and fabrication of hermetically sealed, variable frequency miniature relays. Standard Electric Products Company, Dayton, Ohio. Interim engineering reports no. 1304-9 (Revised), no. 1304-11, no. 1304-12 covering periods November 1, 1951 through January 31, 1952, July 1, 1952 through July 31, 1952, October 1, 1952 through October 31, 1952, under Contract AF33(038)-8897. Feb-Nov 1952. 9p diagr, graph, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 108349

1. Relays, Miniature-Hermetically sealed.

Exposure meter for radiography, no. 3. Characteristics of radiation from one million volt X-ray generator, by Herbert Friedman and Edward der Mateosian. U. S. Naval Research Laboratory. Jan 1944. 17p photos, drawing, diagrs, graphs (1 fold) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 109260

An improved exposure meter is described. Hardness and relative intensity of the X-rays were determined for both transmitted and "reflected" beams. Maximum hardness was one million electron volts, in the transmitted beam, but only 600,000 EV in the 120° beam. With no filtration, transmitted radiation was equivalent to monochromatic 600,000 EV X-rays, and "reflected" radiation was equivalent to 400,000 EV X-rays. NRL H-2214.

Frequency spectra and fault transients of a DC generator, by David H. Schaefer. U. S. Naval Research Laboratory. Feb 1953. 24p diagrs, graphs Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $.75. PB 111170

This paper presents a frequency-spectrum analysis of a dc aircraft generator. Using the results of this analysis, it is shown that eddy-current effects can be treated mathematically, and fault-current transients calculated. The methods used in this work are general so that this report will be of value in stability and transient analysis of any system having a dc generator as a component. NRL R4098.

Junction triode transistor experimental test set, by William N. Keller. U. S. Naval Research Laboratory. May 1953. 11p diagrs Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $.50. PB 111173

A system which permits reasonably accurate determination of the low-frequency internal equivalent parameters of the present type of junction transistor has been developed in experimental form. Constructed for use as a laboratory or engineering-design instrument, it uses a commercially available audio generator, filter, and output voltmeter, together with NRL-designed elements. The parameters measured are those found in the common Y-equivalent circuit representation of the transistor. The accuracy of the test set is estimated to be about ±5 percent for the normal range of transistor parameters. NRL R4143.

Lead telluride rectifier photocells, by A. F. Gibson. Gt. Brit. Ministry of Supply. Telecommunications Research Establishment, Gt. Malvern, Worcs, England. Dec 1950. 30p diagrs, fold graphs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 109301

British crown copyright. T.R.E. memorandum no. 382.
1. Rectifiers, Crystal - Gt. Brit. 2. Crystals, Lead telluride - Photosensitivity - Gt. Brit. 3. Photoelectric cells, Lead telluride - Gt. Brit.

Portable high voltage generator for cathode ray devices, by E. der Mateosian. U. S. Naval Research

Laboratory. Nov 1945. 26p photos, diagrs, graphs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 109504

A light-weight, portable, dry cell supplied high voltage generator suitable for cathode ray devices is investigated in this report. The supply may be designed to deliver stable voltages as high as 25,000 volts at current drains of the order of 1 microampere per 1000 volts. It is entirely electronic in construction and avoids the difficulties encountered in mechanical vibrator generators ordinarily employed. NRL H-2661.

Theoretical aspects of the reciprocity calibration of electromechanical transducers, by Sanford P. Thompson. U. S. Naval Research Laboratory. Oct 1948. 19p diagr Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. Limited supply available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $.50. PB 109570

A unified theory of reciprocity calibration of electromechanical transducers is presented in a form which facilitates the derivation of particular calibration theories. Theories of two types of calibration procedure are treated as special cases. One is shown to reduce, when lumped standards are used, to that of the original technique of Trent; the other is descriptive of a new procedure. NRL F-3371.

Miscellaneous

British electricity system. Report of a productivity team from the United States of America which visited the United Kingdom in 1952. Anglo-American Council on Productivity. Apr 1953. 71p photo, diagrs (1 fold), graphs, maps (1 fold) Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $.75. PB 106474

1. Electric industry - Gt. Brit.

Elac lead sulphide photocell, by C. L. Oxley. U. S. Naval Research Laboratory. Jul 1946. 22p photos, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 109495

The report presents the results of measurements made with seventeen captured German Lead Sulphide photoconductive cells. The cells were designed for dry ice cooling and had resistance ranging from 0.1 to 1.0 megohms at dry ice temperatures. A brief description of the methods of manufacturing the cells as learned from intelligence reports is given. The spectral sensitivity peaked at 2.5 microns and fell to 20 per cent of maximum 0.4 and at 3.3 microns. NRL H-2774.

Electronic transmitting switches for the 225 to 390 megacycle frequency range, by M. Heusinkveld. U. S. Naval Research Laboratory. Jan 1943. 12p photo, drawings, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. Limited supply available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $.50. PB 109496

A system has been devised of using two antennas in parallel and switching the transmitter alternately from one antenna to the other at a superaudible rate, this giving an average effect of the patterns from the two antennas. This report describes the development of and results obtained from such a system and it gives some results of an investigation of the interfering signals produced. NAVSHIPS Prob S1004 R-C. NRL R-2727.

Elektriska vattenvärmare för ladugårdar (Electric water heaters for dairy barns), by Tore Möller and Olle Norén. Jordbruckstekniska Institutet, Ultuna, Uppsala, Sweden. 1952. 66p photos, diagrs, graphs, tables (Text in Swedish) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photostat $8.75. PB 108692

Summary in English.
1. Water heaters, Electric - Sweden 2. Jordbruckstekniska Institutet, Ultuna, Uppsala, Sweden. Meddelande no. 244.

Low frequency operation of balanced ion chambers in an A.C. Bridge, by A. H. Ward (University College of the Gold Coast). Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Jan 1953. 10p diagrs, graphs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.45. PB 109386

HD 846. S. O. code no. 70-674-1-33.
1. Bridges, Electrical measurement - Gt. Brit.
2. Ionization chambers - Sensitivity - Gt. Brit.
3. Ionization chambers - Apparatus - Gt. Brit.
4. Atomic power - Research - Gt. Brit. 5. AERE EL/R 1107.

Measurement of earth conductivity by the wave-tilt method, by W. Searle. National Research Council of Canada. Radio and Electrical Engineering Division. Feb 1953. 24p diagrs, graphs, tables Available from National Research Council of Canada, Ottawa, Canada. $.50. PB 109139

1. Electrical conductivity - Measurements - Canada 2. NRCC 2924 3. NRCC ERA 245.

New base, socket and neoprene protector for G. M. counter tubes, an A.E.R.E. report, by F. Wade. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Oct 1951. 11p photos, drawings, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.75. PB 108676

By the choice of suitable materials a base and socket can be made that will have the properties of high

insulation resistance between pins i.e. not less than 10^9 ohms. The base may be fixed to a Geiger Muller counter by conventional or other means. By inserting the counter and base into a neoprene moulding a hermetic seal is obtained between counter base and moulding. The moulding is designed so that when the counter is inserted into its socket another hermetic seal is made between moulding and socket thereby giving full protection to the base pins and connectors. RD. 581. S. O. code no. 70-674-0-54. AERE EL/R 805.

Properties of electrical insulating materials and methods of test. Gt. Brit. National Physical Laboratory. Aerodynamics Division. 1952. 23p photos, drawings, diagrs, graph, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.35. PB 108706

Notes on applied science no. 3. S. O. code no. 48-120-3.
1. Electric systems - Protection - Gt. Brit. 2. Electrical equipment - Protection - Gt. Brit. 3. Insulation, Electrical - Tests - Gt. Brit. 4. Insulation, Electrical - Properties - Gt. Brit. 5. Properties of electrical insulating materials 6. DSIR NPL NAS 3.

Quartz crystal overtone oscillators, by W. F. Brown. Gt. Brit. Royal Aircraft Establishment, Farnborough, England. Sep 1949. 31p diagrs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108813

1. Circuits, Oscillator - Gt. Brit. 2. Crystals, Quartz - Properties - Gt. Brit. 3. Crystals, Quartz - Resistance - Measurement - Gt. Brit. 4. Oscillators, Crystal - Gt. Brit. 5. RAE TN Rad 460.

Radio frequency power measurement by use of a remote heat sensitive device, by Guy P. Walker. U. S. Naval Research Laboratory. Jul 1946. 13p photos, graph, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. Limited supply available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $.50. PB 109476

This report describes a method of radio frequency power measurement by the use of a thermopile situated at some distance from a radiating vacuum tube, and at the "focus" of a frustrum of a pyramid herein referred to as the horn, whose interior surface is highly polished. A sensitive d.c. microammeter is connected to the thermopile to indicate the readings. With the orifice of the horn directed toward a statically operating electron tube, a calibration of microammeter reading vs. watts dissipated within the tube is obtained. This method is useful in measuring tube dissipation, and also, by subtracting tube dissipation from the input power, the total radio frequency power generated can be determined. NRL R-2841.

Report of test on insulating material, Crolite no. 29, submitted by Henry L. Crowley and Co., Inc., prepared by J. E. Martin. U. S. Naval Research Laboratory. Dec 1942. 9p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. Limited supply available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $.25. PB 109229

1. Insulating materials - Tests 2. Crolite no. 29 (Trade name) 3. NRL R-1973 4. NAVSHIPS Prob M57.

Study of methods of removing stibene from submarine storage battery ventilation gas, by G. W. Work and F. S. Thomas. U. S. Naval Research Laboratory. Sep 1945. 19p table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 109484

1. Stibine - Removal from gases 2. Submarines - Air - Stibine detection 3. NRL P-2636.

Technique for measuring the effectiveness of various shielding materials, by H. E. Dinger and J. E. Raudenbush. U. S. Naval Research Laboratory. Jan 1953. 14p photos, diagr, graphs, tables Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $.50. PB 111109

A technique has been devised whereby the shielding effectiveness against both high- and low-impedance electromagnetic fields can be measured for small samples of any desired materials, including such non-homogeneous constructions as wire mesh and conductive coatings. Measured values are given for a number of commonly used materials. NRL R4103.

Test on insulating material, submitted by Birnbach Radio Company, prepared by J. E. Martin. U. S. Naval Research Laboratory. Dec 1942. 9p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. Limited supply available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $.25. PB 109227

1. Insulating materials - Tests 2. NRL R-1972. 3. NAVSHIPS Prob M54.

Ventilation indicator for submarine storage batteries, by Tad L. Hankins, G. W. Work, M. H. Boyer and F. S. Thomas. U. S. Naval Research Laboratory. Oct 1945. 39p photos, drawings, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 109498

An instrument for the measurement of the individual cell ventilation of submarine storage batteries is described. It is based upon the principles of hot wire anemometry, is simple in construction and easy to build. Details of its construction and adjustment are given. It is shown that with certain changes

the instrument can be adapted to the measurement of many other types of air or gas flow such as wind velocity, air flow in ducts, air speed indication, etc. It can be used with recording electrical instruments in order to obtain a continuous record. NRL P-2629.

Voltage stabilization by means of the corona discharge between coaxial cylinders, by I. H. Blifford, R. G. Arnold, and H. Friedman. U. S. Naval Research Laboratory. Jun 1947. 12p photo, diagrs, graphs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 109177

Positive-wire continuous-corona discharge between coaxial cylinders provides adequate regulation for use with G-M counters, cathode-ray devices, and electron diffraction cameras. NRL N3140.

FOOD AND KINDRED PRODUCTS

Abstract bibliography of the chemistry, processing, and utilization of rice bran and rice bran oil, by Josephine R. Loeb and Nelle J. Morris. U. S. Bureau of Agricultural and Industrial Chemistry. Southern Regional Research Laboratory, New Orleans, La. 1952. 99p Available from U. S. Dept. of Agriculture, Bureau of Agricultural and Industrial Chemistry, Southern Regional Research Laboratory, 2100 Robert E. Lee Blvd., New Orleans 19, La. PB 109728

1. Rice bran - Bibliography 2. Rice bran oil - Bibliography 3. AIC 328.

Study of methods for testing gelatinized corn flour mold and core binders, by Robert E. Morey and J. Robert Kattus. U. S. Naval Research Laboratory. Dec 1945. 26p photo, drawings, graphs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. Limited supply available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $.75. PB 109310

Several tests used in the manufacture and testing of gelatinized corn flour binders have been discussed and investigated. Tentative limits for specifications have been suggested where the test seems appropriate. NRL M-2698.

FUELS AND LUBRICANTS

Animal fats in hot dip tinning, by E. G. Fochtman, L. C. Kinney, and G. G. Ference, R. W. Riemenschneider, S. G. Morris and W. C. Ault. U. S. Bureau of Agricultural and Industrial Chemistry. Eastern Regional Research Laboratory, Philadelphia, Pa., and Armour Research Foundation, Chicago, Ill. Apr 1953. 18p tables Available from U. S. Department of Agriculture, Eastern Regional Research Laboratory, Philadelphia 18, Pa. PB 109395

1. Palm oil - Substitutes 2. Fats, Animal - Use in tinplating 3. Armour Research Foundation, Chicago, Ill. 4. AIC 354.

Effect of high bulk temperatures on boundary lubrication of steel surfaces by synthetic fluids, by S. F. Murray, Robert L. Johnson and Edmond E. Bisson. U. S. National Advisory Committee for Aeronautics. May 1953. 27p photos, diagrs, graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 109400

1. Engines, Turbine propeller - Lubrication 2. Friction - Theory 3. Friction - Surface conditions 4. Lubrication - Chemistry 5. Lubricants, Synthetic - Thermodynamics 6. Steel - Surface treatment 7. U. S. Lewis Flight Propulsion Laboratory, Cleveland, O. 8. NACA TN 2940.

Effect of highly aromatic and non-aromatic fuels on the rubber components of aircraft fuel system, by E. W. Russell. Gt. Brit. Royal Aircraft Establishment, Farnborough, England. Sep 1949. 9p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 108864

The swelling behaviour of a range of rubber components from aircraft fuel systems in fuels containing no aromatics and 25 per cent of aromatics has been examined. Previous conclusions that shrinkage or much diminished swelling are to be anticipated in low aromatic fuels are confirmed. Leakage troubles and low temperature failure may follow. The development of alternative rubber compounds is desirable; the reduction in the maximum aromatic content will in certain cases permit the use of less highly resistant rubbers. RAE TN Chem 1110.

Investigation of silicone polymer fluids. Part III: Performance as hydraulic fluids in gear pumps, by Vincent G. Fitzsimmons and Richard O. Militz. U. S. Naval Research Laboratory. Mar 1945. 28p photos, diagr, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 109545

This report is concerned with the use of dimethyl silicone polymer fluids as non-inflammable fluids for naval hydraulic systems. NRL P-2481.

Physical and chemical properties of commercially available oils adaptable to the replacement of tung oil in synthetic resins, by Samuel B. Crecelius, Dorothy L. Moesta, James B. Ballentine. U. S. Naval Research Laboratory. Jan 1945. 12p fold table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 109535

1. Tung oil - Substitutes 2. Oils - Chemical proper-

ties 3. Oils - Physical properties 4. Castor oil - Physical properties 5. Fish oil - Physical properties 6. Linseed oil - Physical properties 7. Soybean oil - Physical properties 8. Oiticicia oil - Physical properties 9. NRL P-2439.

Storage stability of aviation gasoline and the stability of storage vessels, by Charles Rehbein, George M. Gantz, Carl Lamb. U. S. Naval Research Laboratory. Sep 1941. 58p photos, drawing, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 109544

1. Gasoline - Storage 2. Fuels, Aviation - Storage 3. Tanks, Storage 4. NRL P-1784.

Study of fuels in the aeroresonator motor, period 7-1-45 to 2-1-46, by D. S. Burgess, S. H. Smith, T. K. Rice, K. H. Hayes and C. J. Lindquist. U. S. Naval Research Laboratory. Mar 1946. 42p photos, drawings, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 109494

As a preliminary to fuel studies, performance of a reference fuel (62 octane gasoline), has been studied in six inch aeroresonators. While no attempt has been made to depart from conventional motor design, dimensions have been varied in the design factors of chamber and tailpipe length, tailpipe diameter, a valve box area and "throat" shape and area. Air intake valve tensions are also discussed. Measurements taken over the range of operating fuel values include thrust, air consumption, frequency and temperature. The minimum specific fuel consumption obtained was 2.64 lbs/hr/lb. (specific impulse = 1360) and the maximum thrust 33.5 lbs. NRL P-2777.

Summary of progress in developing non-flammable hydraulic fluids for use in aircraft, by R. O. Militz, D. R. Spessard, and W. A. Zisman. U. S. Naval Research Laboratory. Aug 1946. 20p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 109423

New methods of studying the fire hazards due to the use of high pressure hydraulic systems were investigated. A large number of new fluids were investigated. NRL P-2944.

INSTRUMENTS

Application of the hollow cathode source to spectrographic analysis. Part I: Apparatus, by F. T. Birks. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Dec 1950. 17p photos, drawings, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.90. PB 108842

Appendix: Analyses of helium and argon by the mass spectrograph. S. O. code no. 70-674-0-8. HD 442. 1. Spectrographic analysis - Instruments - Gt. Brit. 2. Mass spectrometers - Design - Gt. Brit. 3. Vacuum tubes, Cathode ray - Gt. Brit. 4. Argon - Spectrographic analysis - Gt. Brit. 5. Helium - Spectrographic analysis - Gt. Brit. 6. Atomic power - Research - Gt. Brit. 7. AERE C/R 601.

Automatic recording spectrophotometer, by Thomas Coor and D. C. Smith. U. S. Naval Research Laboratory. May 1946. 37p photos, drawings, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 109478

An instrument utilizing the monochromator of a Beckman Quartz Spectrophotometer and a Brown "Electronik" recorder has been developed for automatic recording of percent transmission from 2000 to 4000 Angstroms. An increase in resolution has been obtained without appreciable sacrifice in accuracy of transmission measurement and a complete spectrum is automatically recorded in less than fifteen minutes. NRL P-2846.

Daytime measurement of atmospheric transmission of light, by C. A. Pearson. U. S. Naval Research Laboratory. Jul 1952. 14p photos, diagrs, graphs tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108570

The atmospheric transmission of light was determined in the daytime over a 17-mile inclined path in an arid region where the average elevation of the light path was about 5200 feet, by measuring at two locations the apparent brightness of two adjacent areas on a mountainside; one a light, sandy area and the other a dark area. Two photoelectric brightness meters were used. Transmission was also determined on cloudless days by visual measurements of the brightness of the horizon sky and the apparent brightness of a dark bluff at a distance of about 21.5 miles. NRL R3993.

Demountable tetrode ionisation gauge, an A.E.R.E. report, by J. E. Johnston. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Jan 1950. 8p drawing, diagr, graph Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.40. PB 109142

HD. 262. S. O. code no. 70-674-1-26. 1. Ionization - Gt. Brit. 2. Vacuum gages, Demountable - Gt. Brit. 3. Vacuum tubes, Tetrode - Gt. Brit. 4. Atomic power - Research - Gt. Brit. 5. AERE G/R 480.

Divided drift-tube for focussing a proton linear accelerator, an A.E.R.E. report, by J. S. Bell. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Nov 1952. 8p drawing Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.40. PB 108732

S. O. code no. 70-674-1-12.
1. Accelerators, Linear - Gt. Brit. 2. Accelerators - Focussing - Gt. Brit. 3. Protons - Accelerators - Gt. Brit. 4. Atomic power - Research - Gt. Brit. 5. AERE T/R 1072.

Experiments with a differential Pirani gauge leak detector, by A. H. Turnbull. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Mar 1950. 11p drawing, diagrs, graph Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.50. PB 108844

S. O. code no. 70-674-1-23. HD. 274.
1. Detectors, Leak - Gt. Brit. 2. Atomic power - Research - Gt. Brit. 3. AERE G/R 477.

Exposure meter for radiography, prepared by Herbert Friedman and Edward der Mateosian. U. S. Naval Research Laboratory. Apr 1943. 16p photos, drawings, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 109449

An exposure meter has been developed for use with all penetrating radiations harder than 100 kilovolt x-rays. The sensitivity may be varied to cover exposures from a fraction of a minute to 100 hours with type A film. A built-in standard of calibration is provided to check quickly circuit adjustments, eliminating the need for highly stabilized circuits. The exposure meter utilizes a simple type of intensity measuring circuit. NRL H-2028.

Fuel flow rate and fuel quantity system (capacitor type), by J. F. Storm. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn. Apr 1951. 23p diagrs (1 fold), tables (1 fold) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108877s

Contract AF 33(038)-9741.
1. Gages, Fuel - Calibrators 2. Engines, Aircraft - Fuel flow 3. Discs, Drag 4. Generators, Signal - Velocity 5. U. S. Air Materiel Command, Wright-Patterson Air Force Base, Dayton, Ohio 6. AAF TR 5850 suppl. 1.

Full radiation pyrometer suitable for temperature measurements in the range 0° to 100°C, M. G. Davies and H. Kronberger. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Sep 1951. 6p drawings, diagrs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.35. PB 108843

Cover date is 1952. S. O. code no. 70-674-1-09.
1. Pyrometers, Thermoelectric - Design - Gt. Brit. 2. Radiation - Measurements - Gt. Brit. 3. Rotors - Temperature - Measurement - Gt. Brit. 4. Atomic power - Research - Gt. Brit. 5. AERE G/M 144.

Geiger counter technique for high counting rates, by C. O. Muehlhause and H. Friedman. U. S. Naval Research Laboratory. Feb 1946. 28p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 109488

Electronic technique is described for extending the upper limit of counting rates with Geiger-Mueller counters from the usual maximum of about 2500 counts per second to roughly 100,000 counts per second. A theory is proposed to explain the counting process at these high rates and the observed dependence of resolving power on counting rate. The contents of the report include details of the design of a double pulse generator working down to separations of about 0.3 microseconds, and a scaling circuit capable of resolving about 1 megacycle per second of periodic pulses. NRL H-2758.

High speed dilatometer and the transformational behavior of six steels, by A. L. Christenson and E. C. Nelson. U. S. Naval Research Laboratory. Jul 1944. 25p photos, drawings, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 109289

This report describes a high speed dilatometer capable of measuring transformations in steel with cooling rates up to 500°C per second. The transformational behavior of six commercial steels is presented; two of these steels were high tensile steels of the manganese-titanium treated type of almost identical chemical composition. NRL M-2340.

High speed pen recorder and its amplifier, an A.E.R.E. memorandum, by W. M. Barss. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Dec 1950. 11p photo, diagrs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.65. PB 108725

An electro-mechanical pen recorder is described having a linear characteristic and a response time of the order of one second. A model 88 velodyne is used as the electro-mechanical converter. The associated amplifier is of the balanced d.c. type and has a gain of 10 m.a. output (coil current to velodyne) per millivolt input. Provision is made at the input end for several modes of operation. S. O. code no. 70-674-0-43. AERE G/M 76.

Investigation leading to the determination of satisfactory voltage regulator and generator combinations, by Robert L. Mills and Arthur T. McClinton. U. S. Naval Research Laboratory. Mar 1946. 16p photo, graphs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 109491

1. Voltage regulators 2. Generators - Regulators 3. NRL E-2786.

Investigations for design of digital calculating machinery. Harvard University. Computation Lab-

oratory. Under contract W-19-122-ac-24 and AF 33(038)-9461.

Progress report no. 10 covering period May 10-Aug 10, 1950, by Howard Aiken. Aug 1950. 190f photos, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $6.75, Enlargement Print $25.00. PB 108619

1. Computers, Digital - Design 2. Computers, Digital - Components 3. Rectifiers,. Selenium.

Progress report no. 13 covering period 10 May - 10 Aug 1951, by Holly Wilkins, Anthony Cettinger, Lloyd Cali, Robert Burns and Jacquelin Sanborn. Aug 1951. 329f photos, drawings, diagrs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $9.00, Enlargement Print $43.75. PB 108620

Moving-strip Fourier analyzer, by H. J. Grenville-Wells. Graphical method of evaluation certain crystallographic structure factors by H. J. Grenville-Wells. Upper-level precession photography and the Lorentz-polarization correction, by H. J. Grenville-Wells and S. C. Abrahams. Massachusetts Institute of Technology. Laboratory for Insulation Research. Feb 1953. 41p diagrs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 109097

A device embodying Robertson's principle of movable strips is described for performing two-dimensional Fourier summations. The same strips can be used to evaluate sine summations and some three-dimensional summations. Alternatively, the summations can be completed by using masks. The construction of the device, which can accommodate values of $F(hk) = + (1 - 99)$, $h = -15$ to 15, $k = 0$ to 15 for X, $Y = 1/36$ of the repeat distance, is described, and its operation illustrated by an example. O.N.R. Contracts N5ori-07801, N5ori-07858. MIT LIR TR 64. MIT LIR TR 65. MIT LIR TR 66.

Principles of leak detection, by A. H. Turnbull. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Mar 1950. 26p graph, table Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.00. PB 108845

HD. 270. S. O. code no. 70-674-1-24.
1. Detectors, Leak - Gt. Brit. 2. Leaks, Gas - Detection - Gt. Brit. 3. Atomic power - Research - Gt. Brit. 4. AERE G/R 478.

Remote chemical manipulation on a centilitre scale, an A.E.R.E. memorandum, by G. B. Cook, F. Morgan, and W. T. Spragg. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Jan 1951. 6p photos, drawings Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.45. PB 108718

S. O. code no. 70-674-0-48.
1. Beta rays - Counts - Gt. Brit. 2. Gamma rays - Counts - Gt. Brit. 3. Scales, Centilitre - Uses - Gt. Brit. 4. Atomic power - Research - Gt. Brit. 5. Microbalances - Design - Gt. Brit. 6. AERE C/M 103.

Report of test on salinity indicating equipment submitted by McNab of Bridgeport, Inc., Bridgeport, Conn., tested and prepared by F. W. Jank and G. Pida. U. S. Naval Research Laboratory. Feb 1944. 39p photos, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. Limited supply available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $1.00. PB 109258

1. Salinometers - Tests 2. NRL B-2222.

Report of test of twelve wire wound fixed resistors submitted by Ward Leonard Electric Company, prepared by H. A. Brinkman. U. S. Naval Research Laboratory. Mar 1952. 11p photo, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 109452

1. Resistors, Fixed - Tests 2. Resistors, Wire wound - Tests 3. Ward Leonard Electric Co., Mount Vernon, N. Y. 4. NAVSHIPS Prob M3-32 5. NRL R-1854.

Studies of thermal conductivity of liquids. Part II: Investigation of factors affecting the design of a liquid thermoconductimetric apparatus, by Byron C. Sakladis and Jesse Coates. Louisiana. Engineering Experiment Station, Baton Rouge, La. 1953. 65p photos, drawings, graphs, tables Available from College of Engineering, Louisiana State University and Agricultural and Mechanical College, Baton Rouge 3, La. PB 108917

Research conducted under National Science Foundation Research Grant-G 201.
1. Liquids - Thermal conductivity 2. Liquids - Thermal conductivity - Measuring apparatus 3. Instruments, Measuring - Thermo-technical 4. L EES B35.

Study of the earth's electrical field. Fifth quarterly report for period May 1 to Aug 1, 1952 under Contract no. AF19 (122)-467, by R. L. Ives. Cornell Aeronautical Laboratory, Inc., Buffalo, N. Y. Aug 1952. 23p graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108441

The way in which the proposed microwave noise and field intensity meter differs from conventional radar receivers is discussed. Mention is made of use of the AN/APR-4 and AN/APR-9 for noise meter service. Any design to build a noise and field intensity meter for the microwave region requires first a critical study of each of its compoments. The preliminary thinking on the antenna, attenuator, mixer,

and local oscillator for such a set is given. CAL RA-764-P-5.

Transportable radioactivity monitoring equipment used for geological surveying by car, an A.E.R.E. report, by D. H. Peirson. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Oct 1951. 17p photo, diagrs, map, graph Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.75. PB 109141

S. O. code no. 70-674-1-25.
1. Gamma rays - Intensity - Measuring equipment - Gt. Brit. 2. Minerals, Radioactive - Radiometric analysis - Gt. Brit. 3. Geiger-Müller counters - Efficiency - Gt. Brit. 4. Radioactivity - Testing equipment - Gt. Brit. 5. Radioactive substances - Detection - Gt. Brit. 6. Surveying, Geophysical - Equipment - Gt. Brit. 7. Atomic power - Research - Gt. Brit. 8. AERE EL/R 750.

LUMBER AND WOOD PRODUCTS

Progress in the study of plywood finishing systems applicable to airplanes and gliders. Fourth report, by R. L. Benemelis and John M. Leonard. U. S. Naval Research Laboratory. Feb 1945. 18p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 109522

In a continuing study of aircraft plywood finishing, the merit of sealer pigmentation has been examined. A number of different pigments were added in varying concentrations to sealer vehicles. These were applied as undercoats to panels of aircraft plywood and the durabilities estimated by normal and accelerated weathering. Though most pigments were beneficial, the marked superiority of mica seems to warrant a specification requirement to ensure its use, excepting perhaps, those instances in which the sealer is to be aluminized. NRL P-2462.

MACHINERY

Controle van de rondheid van assen (Checking the roundness of shafts), by A. H. Boerdijk. May 1953. 30p diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 109731

Translated and edited by F. A. Raven from De Ingenieur and Werktuig en Sheepsbouev, vol. 64, no. 6, Feb 8, 1952, p. 1-6.
1. Fourier analysis - Netherlands 2. Circularity - Measurement - Netherlands 3. Crankshafts - Tests - Netherlands 4. NAVSHIPS T524 5. STS 172.

Determination of dynamic characteristics of a magnetic-fluid clutch, by A. J. Parziale. Massachusetts Institute of Technology. Servomechanisms Laboratory. Feb 1949. 72p diagrs, graphs (part fold) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.50, Photostat $10.00. PB 109724

The paper begins with a brief outline of the history of the clutch and its present status. A description of a simple magnetic clutch is given for comparison with, and as an aid in studying the principle of, the magnetic-fluid clutch. Includes a discussion of some of the advantages of the magnetic-fluid clutch over former types of clutches. Most of the results obtained are shown in the form of plotted curves. The main portion of the paper is devoted to attempted explanation of results of static and dynamic tests. This discussion is mainly qualitative since the equipment used does not yield conclusive information about the fundamental behavior of the torque transmitting surfaces and mixture particles in the clutch. Contract no. W33-038-ac-13969. D. L C. 6506. MIT SL ER44.

Drop forging. Report of a visit to the U. S. A. in 1949 of a productivity team representing the drop forging industry. Anglo-American Council on Productivity. Apr 1950. 67p photo, drawings, graph, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photostat $8.75. PB 106475

1. Drop forging.

German permanent mold casting machine, by J. M. Ciborski. U. S. Naval Research Laboratory. n.d. 24p photos Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 109485

Enemy equipment consisting of a German permanent mold machine for casting aluminum cylinder heads for radial engines has been disassembled and photographed. Analyses of the materials of construction have been made and the quality of the casting evaluated. Certain advantages or the method of production are given. NRL M-2800.

Precision casting investment produced by application of the hydrometer and cumulative curve methods, by Robert E. Morey. U. S. Naval Research Laboratory. Jun 1946. 26p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. Limited supply available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $.75. PB 109443

A shortage of investment for making precision castings in high melting-point alloys threatened to halt research on precision casting problems. A sample of the material previously used was analyzed by X-ray and chemical methods and its size-distribution was checked by sieving and the hydrometer method. It was found that the size distribution of the material could be accurately reproduced and that coarse silica sand, ground in a ball mill produces a satisfactory investment. Variables in the ball milling process were studied. NRL Problem no. M86. NRL M-2880.

Preliminary investigation of the magnetic-fluid clutch as a servomechanisms component, by P. D. Tilton and A. J. Parziale. Massachusetts Institute of Technology. Servomechanisms Laboratory. Feb 1949. 91p diagrs, graphs (part fold), table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.25, Photostat $12.50. PB 109723

Contract W33-039-sc-13969. D.LC. 6506.
1. Clutches, Magnetic-fluid - Tests 2. Servomechanisms - Components 3. MIT SL ER 45.

Supersonic measurement of wall thickness in Diesel liners, by F. W. Struthers. U. S. Naval Research Laboratory. Jun 1946. 27p photos, diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. Limited supply available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $.75. PB 109288

This report describes studies that have been made at the aimed at modifying the Sonigage so that it can be used to inspect thick materials with curved surfaces. Its application to the measurement of wall thickness in diesel cylinder liners is discussed in detail. The report includes also a brief description of the Sonigage together with its theory of operation, and describes the results of measurements on 19 diesel cylinder liners. NRL S-2850.

MEDICAL RESEARCH AND PRACTICE

Biological and medical aspects of ionizing radiation. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas.

Effect of X-radiation on the isolated frog heart, by Eugene B. Konecci and Herbert B. Gerstner. May 1953. 8p photos, diagr Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 109604

The immediate effects of ionizing radiation on 150 isolated frog hearts were studied. The dose rate was 3,000 r (3 kr) per minute of x-radiation. AAF SAM Proj. 21-3501-0005, Report no. 3.

Effect of X-radiation on Tetrahymena Geleii, by John D. Fulton. Apr 1953. 21p photos, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 109605

A study was made to determine, by densitometric methods, whether or not x-radiation exerts a lethal effect on the protozoon ciliate Tetrahymena geleii and, if so, at what level of x-radiation this lethal effect is produced. AAF SAM Proj. 21-3501-0005, Report no. 4.

Conference on artificial respiration held at Medical Laboratories, Army Chemical Center, Maryland, on 9-10 December 1952. U. S. Chemical Corps. Medical Laboratories, Army Chemical Center, Md. Apr 1953. 123p photos, drawings, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $5.00, Photostat $16.25. PB 109598

Contents: I. Opening remarks, by Milward W. Bayliss. - II. Goals of the conference, by D. B. Dill. - III. The mechanical resuscitator problem, by James L. Whittenberger, Jr. - IV. Discussion, led by Henry K. Beecher. - V. Engineering of mask respirators from the physiological point of view, by Edward P. Radford, Jr. - VI. Discussion, led by Wallace O. Fenn. - VII. Study of pulmonary edema with special reference to the effect of mechanical artificial respiration, by David D. Greene. - VIII. Physiological evaluation of mechanical respirators, by Fred A. Hitchcock. - IX. Mouth-to-mouth artificial ventilation. I: Review and study of gas exchange produced by the method in anesthetized patients, by James O. Elam. - X. Design of hand resuscitator, by James C. Moore. - XI. Construction, operation, and performance of SAM respirator, by Syrrel S. Wilks. - Appx. I. Comments on tentative resuscitator recommendations. - Appx. II. A. Sequence of events leading to final recommendations for mechanical resuscitators. B. Recommendations for mechanical artificial respiration and for mechanical resuscitators for military use. - Appx. III. Ventilation performance test for pressure-cycled resuscitator, by James L. Whittenberger. - Appx. IV. List of conferees. CC MD SR 19.

Effect of temperature on the activity of fly head cholinesterase, by Leigh E. Chadwick and J. Byron Lovell. U. S. Chemical Corps. Medical Laboratories, Army Chemical Center, Md. Mar 1953. 21p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 109365

1. Cholinesterase - Inhibition - Effect of temperature 2. Musca domestica - Effect of temperature 3. Enzymes - Effect of temperature 4. CC MD RR 176.

Effect of various suspension media on the activity of cholinesterase from flies, by L. E. Chadwick, J. B. Lovell, V. E. Egner. U. S. Chemical Corps. Medical Laboratories, Army Chemical Center, Md. Jan 1953. 15p graph, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 109584

1. Cholinesterase - Inhibition - Effect of suspension media 2. CC MD RR 159.

Enzyme studies in acclimatization to high altitudes. I: Brain metabolism during altitude acclimatization, by Harry G. Albaum, and Herman I. Chinn. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. May 1953. 9p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 109601

Acclimatization of rats to lowered barometric pressure equivalent to 11,000, 18,000, and 22,000 feet did not alter significantly the levels of the brain constituents determined. The following fractions were determined: inorganic P, phosphocreatine, organic P, glycogen, lactic acid, adenylic acid, adenosine diphosphate, adenosine triphosphate, hexose diphosphate, glucose-1-phosphate, and diphosphopyridine nucleotide. AAF SAM Proj. 21-1201-0009, Report no. 1.

Human tolerance to acute exposure to six percent carbon dioxide in air and in oxygen, by Clayton S. White, Jane H. Humm, Elizabeth D. Armstrong and Nils P. V. Lundgren. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Mar 1953. 15p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 109602

Human subjects in 50 experiments were exposed for 16 minutes to 6 percent CO_2 in air and in O_2 at a ground level altitude of 5,000 ft. Performance of a card-sorting test was not significantly influenced by breathing CO_2, although one of 31 subjects was unable to complete the experiment. Dyspnea, smell and taste sensations, headache, and sweating were the most common symptoms. Contract no. AF33-(038)-12344. AAF SAM Proj. 21-1402-0001, Report no. 1.

Intelligibility of speech heard at high altitude and sea level, by Chester J. Atkinson. U. S. Naval School of Aviation Medicine, Naval Air Station, Pensacola, Fla. Oct 1952. 15p graph, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108549

Four groups of speakers took part in intelligibility testing at 43,000 feet. One half of each group were speaker-listeners at altitude, the other half were listeners at sea level. Speaker scores at altitude against O2 pressure, as well as monaural listening scores at altitude and at sea level were obtained. Speaker scores improved significantly through one to fifteen days. No statistically significant differences were found between scores of listeners at altitude and listeners at sea level. Joint project report no. 14, Ohio State University Research Foundation, Columbus, Ohio, under Contract N6onr 22525, NR 142-993, and U. S. Naval School of Aviation Medicine, Bureau of Medicine and Surgery project NM 001 064.01-14.

Melting phenomena of a surface of monomolecular thickness, by Dietrich E. Belscher. U. S. Naval School of Aviation Medicine, Naval Air Station, Pensacola, Fla. Feb 1952. 6p photo Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 109734

The direct observation of the phase transition of a monolayer of stearic acid in radioautographs confirms many earlier observations of the melting phenomena of a surface. The surface has no sharp melting point and the transition order-disorder takes place at a considerably lower temperature than in the bulk phase. NMRI Proj NM 001,059.16.08.

Toxicity of industrial organic solvents (Revised in consulation with the Toxicology Committee), by Ethel Browning. Gt. Brit. Medical Research Council. Industrial Health Research Board. 1953. 417p tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N.Y. $4.90. PB 109558

S. O. code no. 46-2-82-52. Bibliography at end of each chapter.
1. Solvents - Toxicity - Gt. Brit. 2. MRC IHRB R80 Revised.

METALS AND METAL PRODUCTS

Anodic aluminum oxides, a preliminary report on methods of preparation and their transport properties, by R. L. Burwell, Jr., and T. P. May. U. S. Naval Research Laboratory. Aug 1946. 102p photos, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.50, Photostat $13.75. PB 109427

Methods of preparing anodic aluminum oxide films free from aluminum have been studied and developed. Films were prepared by complete anodization of aluminum foil through the use of a progressive immersion technique and also by liberation from partially anodized aluminum with solutions of mercuric chloride. Techniques for investigating the permeability of these films with regard to water and salts have been devised. A few exploratory measurements have been made to characterize films according to these techniques. NRL P-2953.

Axial-load fatigue properties of 24S-T and 75S-T aluminum alloy as determined in several laboratories, by H. J. Grover, W. S. Hyler, Paul Kuhn, Charles B. Landers and F. M. Howell. U. S. National Advisory Committee for Aeronautics. May 1953. 63p photos, diagrs, graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D.C. PB.109372

1. Aluminum alloys - Fatigue tests 2. 24S-T (Aluminum alloy) 3. 75S-T (Aluminum alloy) 4. Battelle Memorial Institute, Columbus, Ohio 5. Aluminum Company of America, Pittsburgh, Pa. 6. U. S. Langley Aeronautical Laboratory, Langley Field, Va. 7. NACA TN 2928.

Bend strength of sintered zirconium carbide, by A. R. Hall and W. Watt. Gt. Brit. Royal Aircraft Establishment, Farnborough, England. Dec 1950. 20p photos, drawings, graph, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108862

A resistance-heated hot press for sintering carbides under pressure in graphite dies is described. Results of bend strength determinations at room temperature, 1050°, and 1600°C for sintered compacts of zirconium carbide are given, also electrical resistivity values at room temperature. RAE TN Met 137.

Causes for porosity and leakage in nonferrous castings (Effects of phosphorus in navy gun metal), by Robert A. Colton. U. S. Naval Research Laboratory. Aug 1945. 32p photos, diagr, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 109277

A series of controlled experiments on the effect of phosphorus in Navy composition G indicated that phosphorus probably did not serve as a deoxidizer under the melting conditions used. Residual phosphorus up to 0.02 per cent has been found to improve metal soundness, tensile strength, elognation, yield strength, and Charpy impact resistance, while in a test on running quality 0.025 per cent phosphorus in the metal gave a spiral length at 1150°C equivalent to that at 1210°C when no phosphorus was used. NRL M-2600.

Comparison of the corrosion resistance of aluminum alloy assemblies anodized in sulfuric and in chromic acid, by R. L. Burwell, Jr., W. C. Sierichs, and W. E. McConnaughey. U. S. Naval Research Laboratory. Oct 1945. 18p photos, drawings, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 109463

The corrosion resistance of aluminum alloy assemblies anodized in sulfuric acid has been compared with that of assemblies anodized in chromic acid by several methods of corrosion testing. The assemblies were prepared by riveting together two panels, one of 24ST and the other of 24ST, 2S, or 52S alloys. NRL P-2656.

Composite armor plate ($\frac{1}{2}$ inch thick), by S. Siegel and L. M. Punskey. U. S. Naval Research Laboratory. May 1946. 17p photos, graph, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 109465

A study has been made to determine the feasibility of making composite ($\frac{1}{2}$ inch) armor plate by forge welding two plates of steel, one containing enough carbon to give at least 600 brinell hardness and the other having an alloy content which yields a softer, ductile back. Data are given to show that it should be possible to make armor by this method, if proper precautions are taken with forging and heat treatment. The method should be more economical than face carburizing. NRL M-2831.

Dry pressed aluminum titanate-aluminum silicate turbine stator blades, by J. A. Nelson, T. A. Willmore, D. G. Bennett. Illinois. University. Dept. of Ceramic Engineering, Urbana, Ill. Oct 1950. 16p photos, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108673

Aluminum titanate stator blades for thermal shock tests were bonded with clay or topaz and successfully dry pressed. Compositions with from 5 to 40 percent of aluminum silicates used as bonding material were investigated. Contract W33-038-ac-14520. AAF TR 6097.

Effect of alloying elements on the hardenability of steel. Partial report, prepared by I. R. Kramer. U. S. Naval Research Laboratory. May 1943. 39p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 109450

M. A. Grossmann proposed, in 1942, a method for the calculation of the hardenability of steel from chemical composition. The hardenability was shown to be the product of the base hardenability due to carbon and grain size and factors for each alloying element, the size of the factors depending on the element and the percentage in the steel. The factor principle has been confirmed as well as the magnitude of the effect of the elements, manganese, silicon, nickel, copper, and molybdenum, which Grossmann studied. In addition, the effect of the elements, columbium, cobalt, beryllium, antimony, arsenic, tellurium and germanium has been determined. NRL M-2087.

Effect of notches on the fatigue strength of three light alloys, by W. J. Taylor and N.J.F. Gunn. Gt. Brit. Royal Aircraft Establishment, Farnborough, England. Aug 1950. 66p drawings, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photostat $8.75. PB 109417

1. Aluminum alloys - Fatigue tests - Gt. Brit. 2. Magnesium-zirconium alloys - Fatigue tests - Gt. Brit. 3. Notched bar tests - Gt. Brit. 4. RAE TN Met 42.

Hardness measurement as a method of determining carbon content of carbon and low alloy steels, by K. L. Clark. U. S. Naval Research Laboratory. Aug 1943. 15p photos, drawing, graph Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. Limited supply available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $.50. PB 109336

An improved method for the determination of carbon for control purposes in the melting shop is described. The results are obtained from Rockwell hardness measurements of small, quenched, test castings. Overall time for the determination is approximately two minutes. NRL M-2147.

Internal and external hot tears - their dissimilarity as to appearance, origin and means of elimination, by Harold F. Bishop. U. S. Naval Research Laboratory. Jan 1946. 25p photos, drawings Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. Limited supply available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $.75.
PB 109497

The defect in steel castings commonly known as an internal hot tear is a crack within the casting resulting from shrinkage and inadequate feeding. The external hot tear, caused by restrained contraction, is visible on the surface. Since these two defects arise from different conditions and are remedied by unlike methods it is important that they be properly identified when observed on radiographs so that they can be eliminated. The internal shrinkage tear and the external hot tear have individual characteristics which make their identification possible. Typical examples of both types are illustrated and discussed. NRL M-2745.

Investigation of controlled postheating for welding of medium alloy and aircraft steels, by Clarence E. Jackson. U. S. Naval Research Laboratory. May 1944. 28p photos, drawings, graphs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 109264

1. Steel alloys - Heat treatment - Tests 2. Steel alloys - Welding tests 3. NRL M-2242.

Investigation of the effect of welding on the transition temperatures of Navy high tensile low alloy steels, by R. E. Metius, F. H. Laxar and C. E. Hartbower. U. S. Naval Research Laboratory. May 1946. 41p photos, drawings, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 109477

In an investigation of the effect of welding on the temperature at which a change from ductile to brittle failure occurs in high tensile low alloy steel, it has been found that welding frequently raises the transition temperature of a steel. Two weldability test specimens, the Charpy V-notched bar and a hitherto unreported specimen - the high-constraint nick bend, were found suitable for comparing the performance of welded and unwelded plate at various temperatures. NRL M-2845.

Korrosionsschutz durch polare und apolare deckschichten. (Corrosion protection by polar and nonpolar coatings). Lecture held at the DGF convention, Munich, 6 October 1950, Section VIII, by E. Manegold. Feb 1953. 54p diagrs, graphs, tables (1 fold) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 109048

Translation from Fette und Seifen Part I, Vol. 52, no. 10, 1950, pp. 581-587. - Part II, Vol. 52, no. 11, 1950, pp. 675-680. - Part III, Vol. 52, no. 12, 1950, pp. 725-728. Translated and edited by Prof. F. A. Raven.
1. Coatings, Corrosion resistant - Germany
2. Coatings, Protective - Materials - Germany
3. Corrosion - Protection - Germany 4. NAVSHIPS T 516 5. STS-166.

Laboratory resistance welding unit, an A.E.R.E. report, by R. D. Semmens. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Aug 1951. 10p photos, drawings, diagrs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.50.
PB 108730

HD. 540. S. O. code no. 70-674-0-35.
1. Transformers - Welding - Gt. Brit. 2. Welding, Resistance - Gt. Brit. 3. Metals - Welding - Gt. Brit. 4. Welding equipment - Gt. Brit. 5. Atomic power - Research 6. AERE M/R 739.

Magnesium skim gate material for bronze, by Edwin T. Myskowski and Howard F. Taylor. U. S. Naval Research Laboratory. Nov 1945. 15p photos Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 109474

The elimination or control of dross and foreign particles during the pouring of molten brass and bronze is a serious foundry problem. Entrapment of such impurities in a casting usually causes unsoundness and reduced physical properties of the metal. Due to the inherent toughness of these alloys, the removal of risers by chisel or power saw is also a problem. This report describes the use of thin, perforated sheet steel as an aid in solving both problems. NRL M-2706.

Materials for handling fuming nitric acid. Progress report no. 1 under Contract no. AF33(038)-10381, by M. G. Fontana. Ohio State University Research Foundation, Columbus, Ohio. May 1950. 12p photos, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108643

Project 409.
1. Drums, Steel - Metallography 2. Nitric acid, Red fuming - Storage 3. Steel, Stainless - Thermal properties.

Mechanical and ballistic properties of low carbon iron-manganese alloys. Second partial report, by I. R. Kramer, S. L. Toleman and R. H. Hafner. U. S. Naval Research Laboratory. Feb 1943. 35p graphs, tables Available from Library of Congress Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 109236

The ductility of the low-carbon iron-manganese alloys is improved by the addition of about three-quarters of a percent of molybdenum, chromium, vanadium and columbium also improve the ductility but the tempering treatment for good ductility falls

into a narrower temperature range than when molybdenum is used. For first partial report see NRL M-1815. NRL M-2020.

Mechanical properties of titanium. Third quarterly progress report, part II, May 1, 1951 to Aug 1, 1951. Final technical report under Contract no. AF-33-038-16031, by F. D. Rosi, F. C. Perkins, B. H. Alexander. Sylvania Electric Products, Inc. Metallurgical Laboratories, Bayside, N. Y. Feb 1952. 47p photos, drawings, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 109416

The tensile properties of titanium of commercial purity were investigated in the temperature range 77°K to 925°K (-196°C to 652°C) at constant strain rates of 0.003 min $^{-1}$ and 0.138 min $^{-1}$. The results of these tests showed that this material exhibits the usual mechanical effects associated with strain aging. The curves describing the dependance of a number of mechanical properties on temperature indicate that the strain aging is more marked in certain temperature ranges. Some observations were made on the nature of Lüders bands in an extended, coarse-grained sheet specimen. Report no. YL 52-0451. Project no. 1369.

Mechanism of sintering, by J. P. Roberts. Gt. Brit. Royal Aircraft Establishment, Farnborough, Eng. Jun 1950. 21p diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108861

The present knowledge of the mechanism of sintering is reviewed. In the discussion, sintering is defined as the compound process of the adhesion at elevated temperature of solid particles in contact with one another and the change in dimensions of the compact so formed. Evaporation-condensation, surface diffusion, volume diffusion, viscous flow, and plastic flow are considered. Sintering in the presence of connecting pores is taken as the first stage, and sintering in the presence of isolated pores is taken as the second stage, the two stages being dealt with separately. RAE TN Met 126.

Microradiography of gray cast iron, by E. I. Salkovitz, J. H. Schaum, and F. W. Von Batchelder. U. S. Naval Research Laboratory. Dec 1946. 26p photos, diagr, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. Limited supply available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $.75. PB 109421

In this report, the microradiographic technique is described by which graphite in gray cast iron may be studied with conventional X-ray equipment. The effects of different exposure times, photographic plates, and radiation are shown. Photomicrographs and microradiographs of the same specimens are included in the report to permit comparison of the graphite as observed by the two different methods. NRL M-2947.

Oxidation tests on nickel plated titanium, by D. A. Sutcliffe. Gt. Brit. Royal Aircraft Establishment, Farnborough, Eng. Dec 1950. 4p graph Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 108808

The rate of oxidation of nickel-plated titanium in air at 800°C was compared with unplated titanium and pure nickel. It was found that the rate of oxidation of the nickel-plated titanium was similar to that of the nickel for the first five days, then the surface film cracked and the rate increased to that of the unplated titanium. RAE TN Met 139.

Preliminary electron microscope measurements of particle size in beryllia, an A.E.R.E. memorandum, by C. S. Lees, and S. R. Morgan. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Mar 1951. 12p photos, diagrs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.90. PB 108726

H. 10,952. S. O. code no. 70-674-0-44.
1. Beryllium oxides - Emission - Gt. Brit. 2. Particles - Photomicrographs - Gt. Brit. 3. Microscopes, Electron - Gt. Brit. 4. Atomic power - Research - Gt. Brit. 5. AERE G/M 77.

Process of deformation and workhardening under fatigue stresses, by P.J.E. Forsyth. Gt. Brit. Royal Aircraft Establishment, Farnborough, Eng. Mar 1951. 18p photos, diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 109302

British crown copyright.
1. Metals - Deformation - Gt. Brit. 2. Metals - Hardening - Gt. Brit. 3. Metals - Fatigue - Gt. Brit. 4. RAE TN Met 66.

Properties of quenched and tempered HTS plate, by E. B. Westall and R. P. Dumphy. U. S. Naval Research Laboratory. Jan 1947. 42p photos, drawings, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 109271

Steels of the HT grade of Specification 48S5 are used for ship construction in the as-rolled condition and as such possess relatively low resistance to impact at low temperatures (high transition temperature). In an effort to improve their tensile and notch toughness characteristics, steels of this analysis were quenched and tempered and the results of tensile and notched bar tests show that yield strengths of 70,000 p.s.i. are obtainable in most of the steels at tempering temperatures in the vicinity of 1000°F and that the transition temperature is lowered about 70°C (158°F) at this yield strength level. Nick-bend weldability tests on the heat treated material show an improvement in fracture characteristics over the as-rolled steel but a slight loss in the ductility as measured by the angle at maximum load. NRL M-3040.

Proposals for research on gray cast iron, by J. H. Schaum. U. S. Naval Research Laboratory. Jun 1946. 16p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. Limited supply available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $.50. PB 109341

The literature in the field was comprehensively reviewed and prominent gray-iron metallurgists were interviewed. From information obtained from these sources, the unusual engineering properties of gray cast iron which cause it to be a very useful material for certain applications are described briefly and suggestions are made for various projects which are believed to be most beneficial for improving the properties and technology of gray cast iron. Broad headings of these projects are influence of alloys, constitution diagram, Maurer diagram, test bars, stress relief, gating and risering, correlation of electric furnace and cupola irons, classification of cast irons, effects of gases, and acicular irons. NRL M-2860.

Relation between roughness of interface and adherence of porcelain enamel to steel, by J. C. Richmond, D. G. Moore, H. B. Kirkpatrick and W. N. Harrison. U. S. National Advisory Committee for Aeronautics. Apr 1953. 29p photos, diagr, graphs Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 109376

1. Steel - Coatings, Ceramic - Adherence 2. Coatings, Ceramic - Adherence - Effect of interface 3. U. S. National Bureau of standards 4. NACA TN 2934.

Relaxation of NAX 9115 and SAE 4130 alloy steels, by F. A. Brandt, E. A. Rominski and W. O. Baker. U. S. Naval Research Laboratory. Oct 1944. 30p photos, drawings, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. Limited supply available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $.75. PB 109445

From the data presented it is possible to determine the time necessary to reduce the stress of the above steels from any initial value to any final value within the temperature ranges studied. NRL M-2363.

Research on the weldability of iron alloys (weldability tests of cast steels), by F. S. McKenna and K. E. Fritz. U. S. Naval Research Laboratory. Mar 1945. 26p photos, drawing, graph, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. Limited supply available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $.75. PB 109327

The great increase in the use of welding in steel foundries has necessitated the development of methods for evaluating the weldability of cast steels. The T-bend and nick-bend tests are recommended as direct quantitative tests for determining the effect of changes in welding technique and heat treatment on the ductility of cast steels and for indicating the relative weldability of cast steels of any composition. A stress relief preheat is necessary to prevent under-bead cracking in certain compositions of cast steel. NRL M-2379. NAVSHIPS Prob M-30.

Selected government research reports, vol. 6: Strength and testing of materials. Gt. Brit. Ministry of Supply.

Part I: Theoretical papers on strength and deformation. 1952. 266p photos, diagrs, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $11.00. PB 109052

S. O. code no. 47-166-6-1. Contents: Report no. 1. Theory of indentation and hardness tests, by R. F. Bishop, R. Hill, N. F. Mott (Based on A.R.D. Theoretical research report, Oct 1944). Report no. 2. Theory of wedge indentation of ductile materials, by R. Hill, E. H. Lee, S. J. Tupper (Based on A.R.D. Theoretical research report Apr 1945). - Report no. 3. Theory of wedge penetration at oblique incidence and its application to the calculation of forces on a yawed shot impacting on armour plate at any angle, by R. Hill and E. H. Lee (Based on A.R.D. Report Mar 1946). - Report no. 4. Theory of combined plastic and elastic deformation with particular reference to the deformation of a thick tube under internal pressure, by E. H. Lee, R. Hill, S. J. Tupper (Based on A.R.D. Theoretical research report Mar 1945). - Report no. 5. Theory of the autofrettage of a closed-end tube, by R. Hill, E. H. Lee and S. J. Tupper (Based on A.R.D. report Sep 1946). - Report no. 6. Method of numerical solution of the general plane plastic problem, and its application to the compression of a ductile material between rough plates, by R. Hill, E. H. Lee, S. J. Tupper (Based on A.R.D. Theoretical research report Mar 1946). - Report no. 7. Experiments on the compression of a body between rough plates, by J. F. Nye, prepared at the Cavendish Laboratory, Cambridge (Based on A.R.D. Theoretical research report) n.d. - Report no. 8. Notch brittleness and ductile fracture in metals, by E. Orowan, J. F. Nye, W. J. Cairns, prepared at the Cavendish Laboratory, Cambridge (Based on A.R.D. Theoretical research report Jul 1945). - Report no. 9. Two-dimensional theory of plastic yielding of deeply-notched bars in tension, by R. Hill (Based on A.R.D. Theoretical research report Sep 1946). - Report no. 10. Theory of the extrusion of metals, by R. Hill (Based on A.R.D. Theoretical research report Oct 1945). - Report no. 11. Theoretical analysis of the stresses and strains in wire-drawing, by R. Hill and S. J. Tupper (Based on A.R.D. Report Jul 1947). - Report no. 12. General methods of solution of the axially symmetric problem in plasticity, by R. Hill (Based on A.R.D. Theoretical research report Dec 1946). - Report no. 13. Theory of the yielding and plastic flow of anisotropic metals, by R. Hill (Based on A.R.D. Theoretical research report Jul 1947).

Part II: Testing methods and test results. 1952. 257p photos, diagrs, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $11.00. PB 109053

S. O. code no. 47-166-6-2. Contents: Report no. 14. Nomographic solution of a stress problem, by D. E. Thomas (Based on A.R.D. Met. report Jun 1940). - Report no. 15. Measurement of stress by X-rays, by D. E. Thomas (Based on A.R.D. Met. report Apr 1940). - Report no. 16. Relationship between required test factors and strength variation, by R. D. Starkey and D. R. Cox (Based on R.A.E. Report Feb 1945). - Report no. 17. Relationship between required test factors and strength variation in the case of two types of failures, by D. R. Cox (Based on R.A.E. Technical note Apr 1945). - Report no. 18. Effect of skewness of the frequency distribution on the relationship between required test factors and strength variation, by D. R. Cox (Based on R.A.E. Report Nov 1945). - Report no. 19. Mechanical methods of measuring internal stress. Split ring method as applied to a cold drawn cylindrical cup, by A. Knight and A. E. Morgan (Based on A.R.D. Met. report May 1940). - Report no. 20. Bearing tests on tube, bar and sheet materials, by Flight Refuelling, Ltd. (Based on M.A.P. Scientific and technical memorandum Jan 1944). - Report no. 21. Detection of peel on white-heart malleable iron track links by a non-destructive test, by the Tin Research Institute (Based on report for the Ministry of Supply Dec 1943). - Report no. 22. Investigation of butt-welds in low-carbon steel tubes (Based on report by Metallurgy and Test Depts., R.A.E., Sep 1939). - Report no. 23. Investigations of butt-welds in low-carbon low-manganese steel, by J. M. Robertson and C. W. George (Based on R.A.E. report Feb 1946). - Report no. 24. Investigation of butt-welds in chromium-molybdenum steel, by H. Hipkins and W. J. Taylor (Based on R.A.E. report Mar 1941). - Report no. 25. Mechanical properties of butt-welded joints in chromium-molybdenum steel tubing, D.T.D. 178, by M. S. Fisher and J. T. Ballett (Based on R.A.E. report Jan 1945). - Report no. 26. Strength requirements for spot welds, by D. R. Cox, P. E. Montagnon and R. D. Starkey (Based on R.A.E. Technical note Oct 1945.) - Report no. 27. Investigation of the effect of welding on the mechanical properties of low-carbon manganese-molbydenum steel tubing (D.T.D. 347), by M. S. Fisher (Based on R.A.E. report Mar 1942). - Report no. 28. Transformation of components of stress and strain in two-dimensional elasticity (Based on R.A.E. Technical note May 1945). - Report no. 29. Distribution of stress in a decelerating elastic sphere, by W. R. Dean, I. M. Sneddon, H. W. Parsons (Based on A.R.D. Theoretical research report Jun 1944). - Report no. 30. Distribution of stress in the vicinity of a spherical inclusion, by B. F. Middleton (Based on R.A.E. Technical note Sep 1945).

Some apparatus for melting reactive alloys with high melting points, by D. A. Sutcliffe, J.I.M. Forsyth and R. L. Bickerdike. Gt. Brit. Royal Aircraft Establishment, Farnborough, Eng. Apr 1950. 16p photos, diagrs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108809

A small arc furnace was made in which titanium and some titanium-base alloys can be melted without significant contamination. The effect of melting on some mechanical properties was examined. The construction of a tungsten resistor vacuum furnace capable of heating small samples up to 2500°C is also described. Appendix: Hardness testing of titanium. RAE TN Met 121.

Some observations of the reliability of the clip test for weldability evaluation, by J. A. Rinebolt and J. O. Mack. U. S. Naval Research Laboratory. May 1945. 28p photos, drawings, graph, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 109340

The clip test consists of first attaching a small block of steel or "Clip" to a steel plate by means of a fillet weld; then after standing 24 hours the clip is removed from the plate by hammering the clip on the side opposite the fillet, bending it around the weld as an axis. The type of fracture determines the weldability of the steel; "pull outs" from the base plate indicating poor weldability and a weld fracture indicating satisfactory weldability. NRL M-2566. NAVSHIPS Prob M30-A.

Stress relief of steel castings. First partial report: Relaxation of plain carbon cast steel, prepared by E. A. Rominski and H. F. Taylor, Sr. U. S. Naval Research Laboratory. Mar 1943. 33p photo, drawing, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 109448

1. Steel castings - Stresses - Relaxation 2. Steel, Carbon - Stresses - Relaxation 3. NRL M-2031.

Study of the causes and methods of preventing veins and penetration in sand cast metals, by J. Robert Kattus and Robert E. Morey. U. S. Naval Research Laboratory. Feb 1946. 29p photos, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. Limited supply available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $.75. PB 109489

1. Castings - Flaws 2. Sands, Foundry 3. NRL M-2757.

Substitutes for tin coatings on copper wires. Final report under Contract no. W-36-039-sc-32263, Jul 1, 1946-Jun 30, 1948. Battelle Memorial Institute, Columbus, Ohio. Aug 1948. 158p photos, graphs (part fold), tables (part fold) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $6.00, Photostat $20.00. PB 109472

Pages numbered 302-412. Contents: Part I. Metallurgical development of substitute coating alloys, by R. M. MacIntosh, E. M. Smith, R. J. Nekervis and B. W. Gonser. - Part II. Electrodeposited metal and alloy coatings, by W. P. Ruemmler,

W. C. Schickner and Charles L. Faust. - Part III. Nonmetallic coatings to replace tin on copper wire, by R. M. MacIntosh and B. W. Gonser. - Appendix A. Tables from quarterly reports. - Appendix B. Method of preparing coated wire specimens. - Appendix C. Performance tests for evaluating organic coatings on copper wire. - Appendix D. Patent search on organic tin substitutes. - Appendix E. Subject index to quarterly reports.
1. Wire, Copper - Coatings 2. Tin - Substitutes 3. Coatings, Lead 4. Coatings, Zinc 5. Coatings, Electrolytic 6. Coatings, Non-metallic 7. SIG Contract W-36-039-sc-32263, Final report.

Suitability of a black, iron oxide coating for chaplets and internal chills, by H. F. Bishop. U. S. Naval Research Laboratory. Feb 1944. 27p photos Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 109265

A corrosion resistant black iron oxide coating applied to chaplets and internal chills shows that it compares favorably with the coatings of critical metals generally used. The method of processing which requires dipping the clean part in a hot salt bath is simple and inexpensive. NRL M-2233.

Thermal behavior and mechanical properties of iron-manganese and iron-manganese-nickel alloys, by L. R. Kramer, S. L. Toleman, W. T. Haswell, Jr. U. S. Naval Research Laboratory. Jul 1944. 42p photos, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 109332

Alloys which contain 3-4 per cent Mn, 1-1 1/4 per cent Ni, 1/4 per cent Mo, have excellent ductility. When heat treated to simulate the cooling conditions at the center of an air cooled 18 inch plate, the alloys gave fibrous fracture in both the coupon and high velocity shock tests, which indicate that these alloys may have useful ballistic properties in heavy sections. A low temperature impact study of an alloy MDS showed that it was ductile down to temperatures of -90°C (-130°F). NRL M-2328.

Thermal expansion coefficients of chromium, titanium and zirconium carbides, by J. A. Graham. Gt. Brit. Royal Aircraft Establishment, Farnborough, Eng. Aug 1950. 15p drawings, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 109297

British crown copyright.
1. Chromium carbide - Thermal properties - Gt. Brit. 2. Titanium carbides - Thermal properties - Gt. Brit. 3. Zirconium carbides - Thermal properties - Gt. Brit. 4. Alumina, Sintered - Thermal properties - Gt. Brit. 5. RAE TN Met 130.

Use of gas producing materials for obtaining artificial pressures in blind risers of bronze castings, by R. L. Fox. U. S. Naval Research Laboratory. Feb 1946. 38p photos, drawings, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 109480

The following materials were used in cores of blind risers of bronze castings: plaster of Paris, chalk, sand, graphite, zinc, phosphor copper and copper sulfate. Plaster of Paris and chalk tended to produce gassy metal with low mechanical properties. The sand core was the simplest, most effective method to obtain proper feeding from the blind riser, and produced the soundest metal. NRL M-2753.

Vapor deposition of metals on ceramic particles, by James E. Cline and John Wulff. Massachusetts Institute of Technology. Div. of Industrial Cooperation. Mar 1951. 12p photos, drawing Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 109028

The coating of ceramic particles with metal by vapor deposition was investigated for the production of high-temperature metal-ceramic bodies. Methods are described for coating particles of ceramics such as silica, silicon carbide, and alumina with molybdenum deposited by hydrogen reduction of molybdenum pentachloride and with nickel deposited by decomposition of nickel carbonyl. AAF TR 6457. Contract no. AF33(038)-8879.

Veränderung von korrosionen durch netzmittell III (Change of corrosion by wetting agent III) Translated and edited by F. A. Raven. Luigi Piatti. Mar 1953. 9p photos, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 109137

Translated from Werkstoffe und Korrosion, no. 5/6, 1952, p. 186-188.
1. Steel - Corrosion prevention - Switzerland 2. Wetting agents - Switzerland 3. Sulzer, Gebrüder, A. G., Winterthur, Switzerland 4. NAVSHIPS T 519 5. STS 165.

Weldability of Reynolds R301 T wrought aluminum alloy, by William R. Apblett, Jr. U. S. Naval Research Laboratory. Apr 1945. 25p photos, graph, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 109481

Welding tests on R301T, a high strength aluminum alloy have been made using two commercial aluminum electrodes. Tensile strengths of welded joints have been obtained which are higher than previously reported with the 95% Al - 5% Si electrode, but there is a corresponding loss in ductility. It was found that porosity of the weld metal was greatly decreased by the use of dry electrodes and plates preheated in the range of 200-300°F. With this technique, no porosity was encountered in the welding tests with one of the commercial electrodes. NRL M-2515.

Welding and properties of welded tubing of the SAE x 4130 composition, by Clarence E. Jackson, George G. Luther, Myron A. Pugacz. U. S. Naval Research Laboratory. Jun 1941. 9p photos, graph, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 109455

1. Joints, Welded - Tests 2. Steel alloys - Welding tests 3. SAE x 4130 (Steel alloy) 4. NRL M1747.

METEOROLOGY AND CLIMATOLOGY

Brightness and polarization of the daylight sky at several localities for several altitudes above sea level, by E. O. Hulburt. U. S. Naval Research Laboratory. Feb 1948. 21p diagrs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. Limited supply available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $.75. PB 109569

Tables of values of the brightness B and polarization p of the daylight sky, when free of clouds, in the United States, Switzerland and Brazil are assembled and compared. A table and relations are given from which B and p may be estimated for various altitudes above sea level. NRL N-3257.

Electrical characteristics of snow and ice, a literature search prepared by Francis D. Horigan. U. S. Office of the Quartermaster General. Military Planning Division. Research and Development Laboratories. Technical Library. Apr 1953. 17p Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $.50. PB 111174

The present bibliography on measurement of the electrical characteristics of snow and ice was compiled from a search of the literature of the past five years. Included in the search were such phases of the problem as dielectric constant measurements based on capacitance studies, electrical behavior of ice and snow with emphasis on conductivity, piezoelectric (crystalline) characteristics of ice and snow, space charges in ice, charges from rime layers in snow and ice solutions (thunder-cloud electricity), triboelectrical of "frictional" characteristics of snow and ice. To facilitate classification, all of these characteristics or properties of snow and ice have been grouped under five headings listed in the table of contents. References to glacier ice studies, sea ice studies, and mechanical strength studies have been omitted from the search. QMC TL BS 28.

Investigation of non-linearity in the prediction of surface pressure twelve hours in advance, by G. P. Wadsworth. Massachusetts Institute of Technology. Div. of Industrial Cooperation. Feb 1953. 22p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. Limited supply available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $.75. PB 109675

This study was aimed at the eventual improvement of long-range forecasting through the development of nonlinear techniques applicable to 12-hour forecasts of surface pressure. Although the existence of a slight degree of non-linearity was established, its effective operation proved to be limited to two out of 15 synoptic categories. The actual difference in accuracy between the linear and non-linear forecasting functions was not great enough to yield an improved long-range forecast by repeated application of the non-linear procedure. Contract no. AF 19(122)-446. Scientific report no. 1.

Laboratory ionic impact emission spectra, by C. Y. Fan and A. B. Meinel. Chicago. University. Yerkes Observatory, Williams Bay, Wis. Apr 1953. 21p photo, diagr, graph, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 109674

A spectrographic study has been made of the optical emissions from a rarified air sample under the bombardment of protons (40-230 Kev), deuterons (75-320 Kev), He^+ ions (150-450 Kev), and Ne^+ ions (400 Kev). It was found that the ratio of intensity between the NII and N_2^+ emissions is approximately independent of the energies of the bombarding particles but very dependent upon the species of particle. Contract AF19(122)-480. Technical report no. 1.

Note on high level turbulence encountered by a glider, by J. Kuettner. U. S. Air Force. Cambridge Research Center. Geophysics Research Directorate, Cambridge, Mass. Dec 1952. 9p diagr, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 109613

1. Atmosphere - Turbulence 2. AAF GRD SG29.

Project Cirrus. Occasional report no. 40: Variations in the concentration of condensation nuclei in the atmosphere, by R. E. Falconer, K. Maynard, and B. Vonnegut. General Electric Co. Research Laboratory, Schenectady, N. Y. Apr 1953. 16p photos Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 109721

Eleventh occasional report under Contract no. DA-36-039-sc-15345. Dept. of the Army project: 3-99-07-022. Signal Corps project: 24-172 B-O.
1. Atmosphere - Analysis 2. Meters, Condensation nuclei 3. Atmosphere - Condensation 4. GE RL 825

Solar radiation effect upon the layer formation in the atmosphere, by H. K. Kallmann. California. University. Institute of Geophysics. Mar 1953. 27p graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 109620

The ionized layer formation in the atmosphere under the influence of a quiet sun and under the influence of a disturbed sun has been investigated. The results are illustrated by numerous diagrams. The graphs show the electron density as a function of height under different physical conditions. Contract no. AF-19(604)-111. Scientific report no. 1.

Some aspects of the geostrophic poleward flux of sensible heat, by P. R. Pisharoty. California. University. Dept. of Meteorology, Los Angeles, Calif. Feb 1953. 36p diagrs (part fold), table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. Limited supply available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $1.00. PB 109676

Contract AF19(122)-48. Scientific report no. 2 on investigation of the general circulation of the atmosphere.
1. Weather - Circulation 2. Atmosphere - Temperature 3. Weather forecasting.

Study of planetary atmospheres. Final report under Contract no. AF19(122)-162. Lowell Observatory, Flagstaff, Ariz. Sep 1952. 315p photos, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $9.00, Photostat $40.00. PB 109608

Contents: Introduction. - On the scattering of blue light in the Martian atmosphere, by Alfred K. Blackadar. - Variations in atmospheric absorption over the disks of Jupiter and Saturn, by Seymour L. Hess. - Planetary photography in the light of atmospheric absorption bands, by Seymour L. Hess. - Color changes on Mars, by Seymour L. Hess. - General atmospheric circulation of Jupiter, by Seymour L. Hess. - Atmospheric pressure at the surface of Mars, by Ralph Shapiro. - Study of the behavior of large scale cloud-masses in the earth's atmosphere, by Ralph Shapiro. - Quantitative study of bright and dark spots on Jupiter's surface, by Ralph Shapiro. - Distribution and velocities of bright and dark spots on Jupiter's surface in 1928, by Ralph Shapiro. - Thermodynamic chart for Jupiter's atmosphere, by Edward N. Lorenz. - Vertical extent of Jupiter's atmosphere, by Edward N. Lorenz. - Laboratory studies of the curve of growth of ammonia, by Seymour L. Hess. - Summary of Conference on Solar Variation and Planetary Atmospheres, Aug 1951. - Latitudinal distribution of the relative brightness of Jupiter, and its use in the study of Jupiter's large-scale atmospheric circulations, by Ralph Shapiro. - Linear relationship between sunspot numbers and the relative brightness of Jupiter, by Ralph Shapiro. - On the formation of disturbances in the atmosphere of Jupiter in response to changes in the state of the sun, by Yale Mintz. - Surface temperature of the planet Mars, 1926-1943 by Frank Gifford, Jr. - Measurement of solar variation, by Henry L. Giclas.

Survey of the brightness of the night sky, by E. O. Hulburt. U. S. Naval Research Laboratory. Apr 1948. 17p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. Limited supply available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $.50. PB 109566

Data are assembled for the sky brightness for clear moonless nights in North and South America, the Pacific, and France. The data refer to points in the sky around the compass from the horizon to the zenith, and include a few values for the Milky Way, the zodiacal light and the Magellanic Clouds. NRL N-3263.

Variability of subjective cloud observations, I, by Agnes M. Galligan. U. S. Air Force. Cambridge Research Center. Geophysics Research Directorate, Cambridge, Mass. Mar 1953. 24p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 109614

1. Clouds - Formation 2. Clouds - Movement
3. AAF GRD SG33 4. AAF CRC TR53-10.

MINERALS AND MINERAL PRODUCTS

Cellulose caprate cement, H. A. Tanner, A. Rogovin, and L. Lockhart. U. S. Naval Research Laboratory. Dec 1945. 24p photos, drawings, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 109475

This report describes the development of a new lens cement for optical elements. The cement finally chosen was cellulose caprate. This ester is manufactured by the Eastman Kodak Company and must be purified before use. Details of purification, methods of application and results obtained with its use are given. NRL P-2691.

Research and development of five randomes and data including technical and specification data on ceramic materials AF 156 R and AF 497 developed under Contract No. W33-038-ac-21307 (20345) Supplement to final engineering report. Stupakoff Ceramic & Manufacturing Co., Latrobe, Pa. Jan 1952. 9p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 109725s

Report no. U-12224-29. See also PB 104553 for Interim report.
1. Radar - Domes - Materials 2. Dielectrics - High frequencies 3. Ceramic materials, High temperature 4. AF 156 R (Ceramic material) 5. AF 497 (Ceramic material).

Study of glass sealers, by Peter King and Allen L. Alexander. U. S. Naval Research Laboratory. Sep 1942. 27p photos, tables Available from Library of Congress, Publication Board Project,

Washington 25, D. C. Microfilm $2.00, Photostat $3.75. Limited supply available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $.75. PB 109562

To protect ordinary glass from scattering as a result of bomb blast and gun blast, a restraining material is needed for emergency application to the surface of the glass. This report describes a study made on 19 such materials by several methods of test. NRL P-1934.

Test on insulating material, Centralab cordierite type 400, submitted by Globe Union Company, prepared by J. E. Martin. U. S. Naval Research Laboratory. Jan 1943. 8p table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. Limited supply available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $.25. PB 109230

1. Insulating materials - Tests 2. Cordierite - Tests 3. Centralab cordierite type 400 (Trade name) 4. NRL R-1975.

Test on insulating material submitted by Hartford Faience Company, prepared by J. E. Martin. U. S. Naval Research Laboratory. Jun 1943. 10p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 109451

1. Insulating materials - Tests 2. NAVSHIPS Prob M92 3. NRL R-2051.

Test on insulating material submitted by Louthan Manufacturing Co., by J. E. Martin. U. S. Naval Research Laboratory. Mar 1943. 8p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 109251

1. Insulating materials - Tests 2. NRL R-2014 3. NAVSHIPS Prob M38.

Test on insulating material no. 302 submitted by Globe Union, Inc. (Centralab Division) prepared by J. E. Martin. U. S. Naval Research Laboratory. Aug 1943. 9p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. Limited supply available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $.25. PB 109333

1. Insulating materials - Tests 2. NRL R-2148.

Test on insulating material submitted by Star Porcelain Company, prepared by M. W. Crabb. U. S. Naval Research Laboratory. Aug 1943. 9p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 109334

1. Insulating materials - Tests 2. NRL R-2138 3. NAVSHIPS Prob M-108.

ORDNANCE AND ACCESSORIES

Comparative study of the Chamberlain mount and other shock and vibration mounts, by P. S. Symonds, E. W. Kammer, R. C. Nowak. U. S. Naval Research Laboratory. Sep 1946. 28p photos, drawings, diagrs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 109432

The performance of Chamberlain shock and vibration mounts has been compared with that of other materials ranging in rigidity from that of steel to that of rubber. The comparison has been made both by simple theoretical considerations and by experimental methods. The experimental tests included pendulum impact tests, with impact times of the order of one millisecond, ballistic impact tests, and decay tests on a vibrating cantilever beam. These tests involved vibrations of frequencies up to about 15000 c.p.s. NRL O-2976.

Design of ring springs, by E. Saunders and C. N. Brown. Gt. Brit. Ministry of Supply. Armament Design Establishment. Apr 1950. 20p drawings, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 109298

British crown copyright. Report no. A.D.E.3/50. 1. Springs, Ring - Design - Gt. Brit.

Effects of projectile shock on aircraft armor supports. Final report, by E. W. Kammer. U. S. Naval Research Laboratory. Apr 1946. 15p photos, drawing, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 109529

Data are presented for the forces produced in a corner support for a rectangular armor plate, 30" x 21" x 1/2", subjected to 50 calibre M2 ball ammunition impacts at the center of the plate. Some of these impact records were made with shells yawed 90° so as to strike the plate flatwise. An empirical formula is suggested to include the results of two preceding reports regarding similar data for smaller plates and lighter projectiles. NRL O-2815.

Magnetic influence underwater ground mines: Development of detecting and control devices (a summary report). U. S. Office of Scientific Research and Development. Dec 1943. 22p photo, diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 109629

Summarized from contractor's progress reports, particularly Union Switch and Signal Co. Final re-

port under Contract OEMsr-328, Jul 23, 1943, and Gulf Research and Development Co. Final report under Contract OEMsr-266 (OSRD no. 1557) Sep 15, 1943.
1. Mines, Submarine - Detection 2. Mines, Submarine - Control devices 3. Mines, Magnetic 4. OSRD 1999 5. NDRC Div 17.1.

Turret gun girder stresses. Auxiliary report, 1 Apr 1941 to 1 Aug 1941, by J. S. Brock and H. B. Maris. U. S. Naval Research Laboratory. Aug 1941. 18p photo, fold diagrs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50.
PB 109543

Extends work of NRL report no. H-1570.
1. Beams, Box - Stress analysis 2. Gun mounts - Stresses 3. NRL H-1774.

PAPER AND ALLIED PRODUCTS

Digestion of lignin model substances with sodium hydrosulphide solutions, by Terje Enkvist and Mauri Moilanen. Svenska Träforskningsinstitutet. Träkemi och Pappersteknik. 1952. 6p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 109594

Reprinted from Svensk Papperstidning, vol. 55 (1952) p. 668-673. Summaries in German and Swedish.
1. Lignin - Sulfonation - Sweden 2. Lignin - Reactions - Sweden 3. Sulfate process - Sweden 4. Sodium sulfides - Uses - Sweden 5. Svenska Träforskningsinstitutet. Träkemi och Pappersteknik. Meddelande 115.

Distribution of the carboxyl groups in the cell wall of spruce and birch holocellulose and cotton, by Saara Asunmaa and Paul W. Lange. Svenska Träforskningsinstitutet. Träkemi och Pappersteknik. 1953. 7p diagr, graphs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25.
PB 109592

Reprinted from Svensk Papperstidning, v. 55 (1952) p. 217-223. Summaries in German and Swedish. Pt. II of Distribution of the components in the plant cell walls. For Pt. I see Svensk Papperstidning vol. 53 (1950) p. 749-766. For Pt. III see PB 109595. For Pt. IV see PB 109597.
1. Cotton fibers - Carboxyl distribution - Sweden 2. Birch fibers - Carboxyl distribution - Sweden 3. Spruce fibers - Carboxyl distribution - Sweden 4. Holocellulose - Analysis - Sweden 5. Carboxyl group - Determination in cellulose - Sweden 6. Svenska Träforskningsinstitutet. Träkemi och Pappersteknik. Meddelande 113.

Esterification of the carbohydrates in the plant cell wall with p-phenylazobenzoyl chloride for microspectrographic investigation, by Saara Asunmaa and Paul W. Lange. Svenska Träforskningsinstitutet. Träkemi och Pappersteknik. 1953. 6p photos, graphs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25.
PB 109597

Reprinted from Svensk Papperstidning, vol. 56 (1953) p. 85-90. Summaries in German and Swedish. Part IV of Distribution of the components in the plant cell wall. For Part II see PB 109592 for Part III see PB 109595. Part I in Svensk Papperstidning vol. 53 (1950) p. 749-766.
1. Carbohydrates - Esterification - Sweden 2. Benzoyl chloride, p-Phenylazo - Sweden 3. Holocellulose - Analysis - Sweden 4. Svenska Träforskningsinstitutet. Träkemi och Pappersteknik. Meddelande 118.

Microspectrographic determination of the distribution of periodic acid oxidized regions in the cell wall of holocellulose from spruce, by Saara Asunmaa and Paul W. Lange. Svenska Träforskningsinstitutet. Träkemi och Pappersteknik. 1953. 6p graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25.
PB 109595

Reprinted from Svensk Papperstidning vol. 55 (1952) p. 936-941. Summaries in German and Swedish. Part III of Distribution of the components in the plant cell wall. For Pt. II see PB 109592. For Pt. IV see PB 109597. - Pt. I in Svensk Papperstidning vol. 53 (1950) p. 749-766.

Quellung und steifheit weichgemachter papiere (Swelling and elasticity of softened paper), by J. Kubat. Svenska Träforskningsinstitutet. Träkemi och Pappersteknik. 1953. 3p graphs (Text in German) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 109596

Reprinted from Svensk Papperstidning, vol. 56 (1953) p. 8-10. Summaries in English and Swedish.
1. Paper - Elasticity - Sweden 2. Paper - Softening agents - Sweden 3. Softening agents - Effect on paper - Sweden 4. Svenska Träforskningsinstitutet. Träkemi och Pappersteknik. Meddelande 117.

PERSONNEL APTITUDE TESTING

Analysis of the relative movement test by a method of individual interviews, by Charles M. Lucas. U. S. Bureau of Naval Personnel. Research Division. Classification and Survey Research Branch Mar 1953. 16p table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50.
PB 109607

Contract Nonr-694(00). Project NR 151-13.
1. Personnel - Classification 2. Motion and time study 3. Psychological tests 4. Educational Testing Service, Princeton, N. J.

Assumed similarity measures as predictors of team effectiveness in surveying, by Fred E. Fiedler (Technical report no. 6). Investigation of the character and properties of assumed similarity measures, by Lee J. Cronbach, Walter Hartmann, and Mary E. Ehart (Technical report no. 7) Correction and extension of the relationship of interpersonal perception to effectiveness in basketball teams, by Fred E. Fiedler, Walter Hartmann, and Stanley A. Rudin. Studies performed under Contract N6-ori-07135 with the Office of Naval Research, Project on Social Perception and Group Effectiveness. Illinois. University, College of Education. Bureau of Research and Service. Feb 1953. 43p Available from Bureau of Research and Service, College of Education, University of Illinois, Urbana, Ill. PB 108951

1. Similarity - Theory 2. Group behavior.

Differential characteristics of the more effective and less effective teachers, a summary report of nine studies made for the Office of Naval Research, Dept. of the Navy, by Fred P. Frutchey. U. S. Dept. of Agriculture. Extension Service. Feb 1953. 16p table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 109403

1. Teachers - Effectiveness.

Effect of a pre-film test on learning from an educational sound motion picture, by J. J. Stein. Pennsylvania State College, State College, Pa. Nov 1952. 17p photo, graph, tables Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $.25. PB 111172

Contract N6onr-269. Based on thesis submitted to Cornell University.
1. Motion pictures, Educational 2. Training - Research 3. SDC TR 269-7-35.

Electric multiple choice maze, by Haym Kruglak, Craige E. Schensted, and Herschel C. Self. Minnesota. University. Dept. of Physics. Nov 1952. 17p photos, diagr, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108716

The device, named the electromaze, offers some promise as a research instrument in psychology of learning. The electromaze is an application of switching circuits and requires no overt verbal, mathematical, or figure symbols characteristic of paper-and-pencil mental tests. The apparatus has been used as a reasoning test with graduate students in physics and journalism. Contract N8onr-66213, Project NR192-041.

Training critera for selected MOS's: Report prepared for Manpower Analysis Section, PR & P Br., TAGO. Final report under Contract no. DA-49-083- OSA-524, by C. Thomas Clifton, Reuben S. Horlick and Martin J. Byrne. Clifton Corporation, Washington, D. C. Dec 1952. 52p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 109366

Dept. of the Army Project no. 29550100, Subtask 76. Personnel Research Section PR 5076.
1. Military training - Specialties 2. Personnel, Military - Training 3. Training - Research 4. U.S. Adjutant General's Office. Personnel Research Section 5. WD AGO PRS 989.

PHOTOGRAPHIC AND OPTICAL GOODS

Electro-optical shutter for photographic purposes, by A. F. Zarem, F. R. Marshall, F. L. Poole. U. S. Naval Ordnance Test Station, Inyokern, Calif. May 1948. 36p drawing, diagrs, graphs, table Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. Mimeo: $1.00. PB 111186

The electro-optical shutter, provides a versatile and practical means for obtaining exposure times over a wide range. Because it contains no mechanical moving parts, it offers the possibility of attaining exposure times several orders of magnitude less than are obtainable by other means. The phenomenon of electrical birefringence (the electrostatic Kerr effect) is not a generally familar one and is consequently discussed in some detail. NOTS 133. NAVORD 1016.

Extension of the Luneberg-type lenses, by J. E. Eaton. U. S. Naval Research Laboratory. Feb 1953. 18p drawings, diagrs Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $.50. PB 111147

The spherical lens first investigated by Luneberg, for which scanning throughout space without distortion is possible, has been generalized to permit the source to lie within the lens, thereby reducing the size of the path followed by the source in scanning. This, and other spherical lenses with complete spherical symmetry that simulate line sources and infinite plane reflectors, appear as special cases of an extension of the class of circularly symmetric circular lenses due to Luneberg. Luneberg considered only the case in which the real and apparent sources were located at diametrically opposite points outside the lens. NRL R4110.

Exterior orientation of near-vertical aerial photographs: Computational procedure and illustrated examples, by Vernon A. Rybski. Ohio State University Research Foundation. Mapping, Charting and Reconnaisance Research Laboratory. Feb 1952. 29p diagrs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108623

Contract no. AF 18(600)-90. Technical paper 156. Project 485.
1. Photography, Aerial - Research 2. Photographic interpretation 3. AAF WADC TR 52-95.

Investigation of metallic delay lenses. Final report on Contract no. W36-039-sc-38250, Mar 15, 1949 to Mar 15, 1951. Sperry Gyroscope Co., Inc., Great Neck, N. Y. May 1951. 333p photos, fold diagrs, fold graphs, fold table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $9.00, Photostat $42.50. PB 108907

The historical and theoretical aspects of the problem are discussed initially, and the molecular-structure and equivalent-circuit methods of analyzing delay media are then described in detail. An existing mathematical solution for the metal-strip medium is developed in order to obtain basic information applicable to other types of media. Extensive experimental measurements were made on various obstacle shapes in order to provide design information for delay lenses. Birefringence in metallic delay media is also analyzed in this report, and a general method of avoiding deleterious effects due to this cause is proposed. Various methods of fabricating a practical delay lens are investigated in detail, and considerable information is given on materials and techniques. The design of the experimental delay lens constructed at the end of the program is described, and the experimental results are presented with a complete discussion of their significance. Sperry report no. 5224-1235. Dept. of the Army project: 3-99-05-022. Signal Corps project: 22-122B-0.

Investigation of rapid photo-processing solutions. Progress report no. 3 under Contract no. AF33-(038)22966, by Mahlon H. Dickerson. Southwest Research Institute. Physics Dept. Photographic Laboratory, San Antonio, Texas. Oct 1951. 249p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $9.00, Photostat $31.25. PB 109857

Detailed chapters are devoted to developers (development accelerators, developing agents, developer constituents - variables and coefficients); fixers (fixation accelerators, fixing agents - stabilization, fixer constituents); hardening agents; replenishers (developer replenishment, short stop replenishment, fixer replenishment); emulsion characteristics (speed, contrast, grain - resolving power, etc); washing (mineral content of wash water, sea water/fresh water cycle, etc.); drying (chemical agents, air); test procedures (grain size, resolving power, etc.); processing procedures (two-bath process, rapid processing, etc.); theoretical considerations - effects; special materials, techniques, equipment.

On the possibility of obtaining geodetic connections between two distant points on the earth's surface by lunar photography, by Arne E. Slettebak. Ohio State University Research Foundation. Mapping, Charting and Reconnaisance Research Laboratory. Jan 1952. 20p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108622

Contract no. AF 18(600)-90. Technical paper 155. Project 485.
1. Photography, Lunar 2. Geodesy - Research 3. AAF WADC TR 52-93. 4. OSURF TP 155.

Variable-frequency light synchronized with a high-speed motion-picture camera to provide very short exposure times, by Walter F. Lindsey and Joseph Burlock. U. S. National Advisory Committee for Aeronautics. May 1953. 17p photos, diagrs Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 109582

1. Flow - Photography 2. Photographic equipment, Motion picture - High speed 3. U. S. Langley Aeronautical Laboratory, Langley Field, Va. 4. NACA TN 2949.

PHYSICS

General

Effect of the surface on the magnetic properties of an electron gas, by Harvey Brooks and F. S. Ham. Harvard University. Cruft Laboratory. Mar 1953. 58p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 109576

Contract N5ori-76, Task order no. 1, NR-078-011.
1. Electrons - Magnetic moments 2. Equations, Integral 3. Magnetic fields - Mathematical analysis 4. HU CL TR 169.

Electrolytic tank developed for obtaining velocity and pressure distributions about hydrodynamic forms, by A. Borden, G. L. Shelton, Jr. and W. E. Ball, Jr. U. S. David W. Taylor Model Basin. Apr 1953. 36p photos, diagrs, graphs, tables Available free from U. S. Navy Department, David W. Taylor Model Basin, Washington 7, D. C. PB 109397

The design and development of an electrolytic tank is described and a discussion is given of some of the difficulties encountered in putting the tank into operation. The techniques developed for finding the velocity and pressure distributions about cylindrical bodies and about three-dimensional bodies of revolution are described, and some results obtained for bodies with known velocity and pressure distributions are presented. DWTMB 824.

Floating breakwaters in shallow water, by J. J. Stoker, B. Fleishman, L. Weliczker. New York University. Institute for Mathematics and Mechanics. Feb 1953. 47p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 109406

Contract no. Nonr-285(06). IMM-NYU 192.
1. Breakwaters 2. Hydrodynamics - Theory.

Fluid dynamic notation in current use at N.G.T.E., by S. Gray. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Jul 1950-Jul 1952. 27p diagrs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.25. PB 108837

S. O. code no. 23-9006-97. Includes Addendum, Jul 1952. Memorandum no. M.93.
1. Mathematics, Applied - Notation - Gt. Brit. 2. Dynamics, Gas - Theory - Gt. Brit. 3. Compressors, Axial - Theory - Gt. Brit. 4. Cascades (Aerodynamics) - Theory - Gt. Brit. 5. Gt. Brit. National Gas Turbine Establishment 6. ARC CP 97.

Gravity field for an ellipsoid of revolution as a level surface, by Walter D. Lambert. Ohio State University Research Foundation. Mapping, Charting and Reconnaisance Research Laboratory. May 1952. 46p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 108626

Contract no. AF18(600)-90. Technical paper no. 161.
1. Gravity - Theory 2. Mathematical equations and solutions 3. OSURF TO 161 4. AAF WADC TR 52-151.

Mathematical treatment of random coalescence, by Z. A. Melzak and Walter Hitschfeld. McGill University. MacDonald Physics Laboratory. "Stormy Weather" Research Group. Mar 1953. 31p graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfiom $2.25, Photostat $5.00. PB 109626

Contract no. AF-19(122)217. Scientific report MW-11.
1. Particles - Coalescence - Theory 2. Particles - Distribution - Mathematical analysis.

Mikrostructura turbulentnogo potoka (Microstructure of turbulent flow), by A. M. Obukhoff and A. M. Yaglom. Jun 1953. 41p graphs Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 109578

Translated by S. Reiss from Prikladnaya Matematika i Mekhanika, v. 15, 1951, p. 3-26.
1. Flow, Turbulent - Theory - Russia 2. Kolmogoroff's theory (Turbulence) 3. Atmosphere - Turbulence - Theory - Russia 4. U. S. National Advisory Committee for Aeronautics 5. NACA TM 1350.

Momentum transfer in two-phase flow, by Arnold Paul Schueler. Jan 1951. 46p diagr, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $4.50. PB 108644

Thesis - University of Illinois.
1. Flow, Fluid - Measurements 2. Flow, Turbulent - Measurements 3. Liquids - Flow measurements 4. Reynolds number - Effect.

New studies of nitrogen afterglows, by Marx Brook. California. University. Institute of Geophysics. Mar 1953. 72p photos, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.50, Photostat $10.00. PB 109621

A flow system is used to mix the long lived nitrogen afterglow with helium and argon after the glowing gas emerges from the discharge. Large intensity modifications in the first positive afterglow bands are produced, similar to those found by mixing nitrogen with a rare gas prior to the discharge. Some new nitrogen afterglow bands are present in the photographic infrared. Contract no. AF 19 (122)-453. Scientific report no. 1.

Quarterly progress report no. 8 on Project N5ori-07856. Massachusetts Institute of Technology. Solid-State and Molecular Theory Group. Apr 1953. 71p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.50, Photostat $10.00. PB 109399

Contents: Survey. - 1. Two-electron example of ferromagnetism, by J. C. Slater. - 2. Simple model of ferromagnetism, by H. Statz. - 3. Theory of ferromagnetism, by R. Kikuchi. - 4. Spin operator method, by G. W. Pratt, Jr. - 5. The water molecule, by G. F. Koster and H. C. Schweinler. - 6. Spherical Bessel functions of half integral order and imaginary argument, by F. J. Corbaté, G. F. Koster, H. C. Schweinler. - 7. Configuration interaction applied to the hydrogen molecule, by E. Callen. - 8. Nuclear electric quadrupole interaction in the KC1 molecule, by L. C. Allen. - 9. Configuration interaction in the hydrogen fluoride molecule, by R. E. Merrifield. - 10. Configuration interaction for the fluorine molecule, by J. H. Barrett. - 11. The carbon-carbon bond in ethane, by A. Meckler. - 12. Limited configuration interaction treatment of the NH_3 molecule, by H. Kaplan. - 13. Study of 2 Z_p in atoms, by A. J. Freeman. - 14. Orbital effect in neutron-electron magnetic scattering, by W. H. Kleiner. - 15. Adsorbed surface layers on semiconductors, by H. Statz. - 16. Connection between the many-electron interaction and the one-electron periodic potential problems, by H. C. White.

Shock produced by a collapsing cavity in water, by M.F.M. Osborne. U. S. Naval Research Laboratory. Oct 1942. 51p drawings, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 109244

Contents: Appendix I: Microphone calibration. - Appendix II: Discussion of the incompressible theory.
1. Water - Acoustic properties 2. Noise, Cavitation - Analysis 3. Shock, Compression 4. Shock waves - Hydrodynamics 5. Impact tests 6. Microphones - Calibration 7. Equations of motion 8. NRL S-1952.

Approach to criticality of a cylindrical pile, by J. F. Hill. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Mar 1951. 6p graphs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.35. PB 109560

S. O. code no. 70-674-1-32.
1. Atomic piles - Critical size - Gt. Brit. 2. Atomic power - Research 3. AERE R/M 5.

Calculations of tolerance flux of fast neutrons taking into account the effect of energy loss due to non-hydrogenous nuclei in the tissue, by M. B. Biram. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. 1952. 8p table Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.40. PB 108852

HD. 809. S. O. code no. 70-674-1-11.
1. X-rays - Dosage determination - Gt. Brit. 2. Tissue - Effects of radiation - Gt. Brit. 3. Radiation - Biological effects - Gt. Brit. 4. Neutrons - Energy distribution - Gt. Brit. 5. Mathematical equations and solutions - Gt. Brit. 6. Atomic power - Research - Gt. Brit. 7. AERE T/R 1062.

Evaluation of optical matrix elements by a method of distorted Coulomb eigen-functions, by Edward H. Kerner. Iowa State College. Physics Dept., Ames, Iowa. Oct 1952. 23p graph, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. Limited supply available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $.75. PB 109677

It is shown in this report how hydrogenic wave functions may be distorted into non-Coulomb functions of, the Hartree type, by performing a continuous change of scale on the parameter Z which specifies the nuclear charge. Two kinds of characteristic distortion functions are discussed, and their differential equations and general structure deduced. On the assumption that a single distortion function is adequate to describe a number of electronic states, it is shown how optical matrix elements may be found in closed form as generalized hydrogenic matrix elements. This assumption is supported by a few illustrative results. Contract no. AF19(122)-469. Research report no. 2.

Method for the amperometric titration of thorium, an A.E.R.E. memorandum, by A. A. Smales and L. Airey. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. n.d. 5p graphs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.35. PB 108719

H. 12.989. S. O. code number is omitted.
1. Thorium - Determination, Amperometric - Gt. Brit. 2. Ammonium molybdate - Use as a reagent - Gt. Brit. 3. Atomic power - Research - Gt. Brit. 4. AERE C/M.131.

Neutron diffusion at large distances from the source, by K. T. Spinney. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Jan 1950. 13p Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.65. PB 108851

S. O. code no. 70-674-1-22.
1. Neutrons - Diffusion - Theory - Gt. Brit. 2. Boltzmann's equation - Gt. Brit. 3. Fourier - Laplace equation - Gt. Brit. 4. Atomic power - Research - Gt. Brit. 5. AERE T/R 467.

Notes on the fluid dynamic and heat transfer aspects of reactor design, by W. A. Spraker. Consolidated Vultee Aircraft Corporation. Fort Worth Division, Fort Worth, Texas. Sep 1951. 21p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108752

Report FZA-X6-501. Some pages will not reproduce well.
1. Reactors, Neutron - Heat transference 2. Reactors, Neutron - Dimensions - Calculations 3. Atomic power - Research.

One and two group theory of cylindrical piles, by J. F. Hill. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Oct 1949. 35p Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.25. PB 109561

S. O. code no. 70-674-1-35.
1. Atomic piles - Theory - Gt. Brit. 2. Neutron fluxes - Theory - Gt. Brit. 3. Atomic power - Research - Gt. Brit. 4. AERE T/R 170.

STRUCTURAL ENGINEERING

Comparative analysis of welded connections, by Victor J. Bienlek. Jun 1950. 101p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.50, Photostat $13.75. PB 109830

Various design methods are presented to afford a more thorough understanding of the principles of welded connections. Various types of welded connections are considered for a particular case; then an example problem using each method is computed and the results are compared, not only as a numerical answer but for the practicability and understanding of the design. The advantages of structural welding are pointed out. Butt welds, fillet welds, design of plug and slot welds, design of flexible seat connections, design of stiffened seats, design of web connections, and continuous frame connections are described. Thesis-Rensselaer Polytechnic Institute.

Creep-buckling analysis of rectangular-section columns, by Charles Libove. U. S. National Advisory Committee for Aeronautics. Jun 1953. 24p diagrs, graphs Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 109708

1. Creep - Theory 2. Plastic structures - Stress analysis 3. Equations, Differential 4. U. S. Langley Aeronautical Laboratory, Langley Field, Va. 5. NACA TN 2956.

Effect of variation in rivet strength on the average stress at maximum load for aluminum-alloy, flat, Z-stiffened compression panels that fail by local buckling, by Norris F. Dow, William A. Hickman and B. Walter Rosen. U. S. National Advisory Committee for Aeronautics. Jun 1953. 17p graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 109837

1. 75S-T6 (Aluminum alloy) 2. Plates, Flat - Compression tests 3. Aluminum alloys - Compression 4. Airplanes - Stress analysis 5. Rivets, Aluminum alloy 6. Rivets - Strength 7. U. S. Langley Aeronautical Laboratory, Langley Field, Va. 8. NACA TN 2963.

Hoop stresses produced in curved tubes, by in-plane bending moments, by T. E. Pardue. U. S. Naval Research Laboratory. Feb 1953. 8p diagrs, graphs Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $.25. PB 111171

Stresses in curved tubes, due to in-plane bending moments, include hoop stresses which are superimposed on the transverse bending stress. The two add at the inside surface and subtract at the outside. Previous theoretical calculations have neglected the hoop stresses, because they contributed a negligible amount to the total elastic energy stored in the pipe bend. Calculations of the hoop stresses have now been made using existing values of longitudinal stresses. NRL R4114.

Investigation of wood prefabrication, by Richard W. Duggan. May 1950. 98p drawings Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.25, Photostat $12.50. PB 109822

The discussion is limited to houses prefabricated with wood and plywood as basic materials. A brief history of prefabrication is given, followed by basic information on wood and plywood. The factors affecting the use of wood in housing are discussed and a study is made of the grading and strength of housing material, of the processing of wood, of glues and gluing, joints and fastenings, as well as of prefabrications operations. Thesis-Rensselaer Polytechnic Institute.

Nekotorye voprosy teorii polzuchesti (Some problems of the theory of creep), by Y. N. Rabotnov. Translated by S. Reiss. Apr 1953. 19p graphs Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 109384

Translated from Vestnik Moskovskovo Universiteta, no. 10, 1948, p. 81-91.
1. Creep - Theory - Russia 2. NACA TM 1353.

New L-shaped fence staple, by E. George Stern. Virginia. Engineering Experiment Station, Blacksburg, Va. 1953. 4p drawings Available from Virginia Engineering Experiment Station, Blacksburg, Va. PB 109612

See also PB 109396 for technical details.

Non-destructive method for measuring wall thickness of pipe from one side, by Herbert Friedman, Edward der Mateosian and Joseph J. Nemecek. U. S. Naval Research Laboratory. Jan 1944. 7p diagr, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 109259

1. Pipe - Measurement 2. NRL H-2218.

Rotating beam deflection studies, by J. B. Tiedemann, I. Vigness, and T. E. Pardue. U. S. Naval Research Laboratory. May 1953. 19p photos, drawing, diagrs, graphs, table Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $.50. PB 111183

Thick-walled mild-steel cylinders, while rotating about their axes, were bent transversely by forces applied perpendicular to their lengths. The magnitudes of the loads, and of the internal energy losses per cycle, were determined as a function of angle of bend. Experiments were made, on separate specimens, at different constant rotational speeds and at different constant rates of transverse bending. NRL R4139.

Scale model test of main steam piping for CVB 41 class vessel, by T. E. Pardue and P. S. Symonds. U. S. Naval Research Laboratory. Apr 1945. 23p photos, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 109482

The reaction forces and moments for a section of piping from the super-heater outlet of Boiler 1A to Frame 131, on a CVB41 Class Vessel, have been determined by scale model test. Experimental results, obtained from a full-scale short radius pipe bend, are given for the stress intensification factor for bending both in the plane and normal to the plane of the bend. These results were used in the computation of the equivalent stress at various positions on the piping system. NRL O-2513.

Structural analysis and design of an arched roof truss, by William Lenox Thoen. Jun 1950. 75p drawings (part fold), graphs (part fold), tables (part fold) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.50, Photostat $10.00. PB 109827

A structural analysis was made of an arched roof truss in order to present, in simplified form, information useful to an architect in the design of a statically indeterminate arch rib. All important parameters and problems are presented by a semi-graphical method. To facilitate the understanding of this method, a complete problem is worked out. The main chapters of the study are concerned with loading conditions and stresses, arch types, the arch axis, and influence lines for springing, crown, and quarter-point. Data are also given on column-analogy and neutral-point check, impressed distortions. Thesis-Rensselaer Polytechnic Institute.

Study of form factors for aluminum alloy I beams, by John R. Holtz. Jan 1950. 59p photos, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2 75, Photostat $7.50. PB 109832

A study was made of form factors for aluminum alloy I-beams. The form factors allow a determination and comparison of allowable bending stresses of various types of beams to be made. A chart was developed which permits determination of the allowable combined compressive and bending stress in spruce beam. The form factor chart also shows the relative closeness between the ultimate and yield bending stresses. The feasibility of the development of a more complete chart involving compression and the use of aluminum is shown. Thesis-Rensselaer Polytechnic Institute.

TEXTILES AND TEXTILE PRODUCTS

Fatigue test of fabrics. Final report (no. 18) under Contract W-44-009-Eng-527, modification no. 3, period 1 Sep 1949 to 31 Mar 1951. Turk, C. K., Corp., South Bend, Ind. Mar 1951. 28p graphs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 109638

The development and testing of coated fabrics revealed that a short time tensile test may give a tensile strength value much higher than the same fabric will withstand when loaded for longer intervals. A study was made to collect data and establish a relationship of strength vs time for selected fabrics. The data gathered in the investigation is presented in graphic form. The safe working stresses of the test fabrics under each condition of test are summarized in table.

TRANSPORTATION EQUIPMENT

Aeronautics

Aircraft

Audible P-80 jet aircraft noise, by Weiant Wathen-Dunn. U. S. Naval Research Laboratory. Mar 1948. 30p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.00. Limited supply available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. $.75. PB 109567

Measurement and analysis of acoustic energy generated in 100-cycle to 10-kilocycle band by P-80 running at full throttle on the ground. The data were used to compute octave-band levels in same frequency range and from these overall levels were computed which checked within 2 db of levels actually measured. NRL S-3266.

Determination of mean camber surfaces for wings having uniform chordwise loading and arbitrary spanwise loading in subsonic flow, by S. Katzoff, M. Frances Falson and Hugh C. DuBose. U. S. National Advisory Committee for Aeronautics. May 1953. 43p diagrs, graphs, table Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 109579

1. Flow, Subsonic - Theory 2. Wings - Aerodynamics - Theory 3. Wings, Sweptback - Camber 4. Wing theory 5. U. S. Langley Aeronautical Laboratory, Langley Field, Va. 6. NACA TN 2908.

Zero-lift drag of a slender body of revolution (NACA RM-10 research model) as determined from tests in several wind tunnels and in flight at supersonic speeds, by Albert J. Evans. U. S. National Advisory Committee for Aeronautics. Apr 1953. 40p diagrs, graphs, table Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 109381

1. Bodies of revolution - Drag 2. Bodies of revolution - Supersonic characteristics 3. Flow, Supersonic 4. Mach number - Effect 5. Reynolds number - Effect 6. RM-10 (Body of revolution) 7. Airplanes - Models - Wind tunnel tests 8. NACA TN 2944.

NATIONAL SCIENCE FOUNDATION

Russian Translations

The following translations prepared by Columbia University and printed by the Atomic Energy Commission are available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C., at the prices quoted.

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